LG

MICROWAVE OVEN
SERVICE MANUAL

MODEL: MH-654S

CAUTION
BEFORE SERVICING THE UNIT, READ THE SAFETY PRECAUTIONS IN THIS MANUAL.

SAFETY PRECAUTIONS

This device is to be serviced only by properly qualified service personnel.
Consult the service manual for proper service procedures to assure continued safety operation and for precautions to be taken to avoid possible exposure to excessive microwave energy.

PRECAUTIONS TO BE OBSERVED BEFORE AND DURING SERVICING TO AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY

A) Do not operate or allow the oven to be operated with the door open.

B) Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary; (1) interlock operation, (2) proper door closing, (3) seal and sealing surfaces (arcing, wear, and other damage), (4) damage to or loosening of hinges and latches, (5) evidence of dropping or abuse.

C) Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, wave guide or transmission line, and cavity for proper alignment, integrity, and connections.

D) Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation and transmission systems shall be repaired, replaced, or adjusted by procedures described in this manual before the oven is released to the owner.

E) A microwave leakage check to verify compliance with the Federal Performance Standard should be performed on each oven prior to release to the owner.

CAUTION

MICROWAVE RADIATION

DO NOT BECOME EXPOSED TO RADIATION FROM THE MICROWAVE GENERATOR OR OTHER PARTS CONDUCTING MICROWAVE ENERGY.

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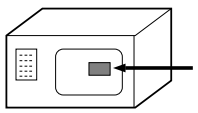
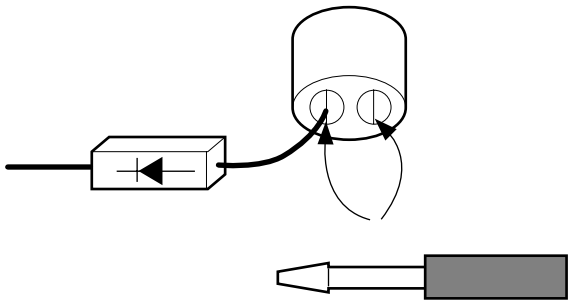
SPECIFICATIONS

ITEM	DESCRIPTION
MODEL	**MH-654S**
Power Requirement	230 Volts AC 50 Hz Single phase, 3 wire grounded Microwave 1,200W Gril 1,100W Combination 1,250W
Power Output	800 Watts full microwave power (IEC705)
Microwave Frequency	2,450 MHz
Magnetron	2M214 - 39F, 2M218J
Timer	0 ~ 90 min.
Outside Dimensions	483 (W) x 285 (H) x 355 (D) mm
Cavity Dimensions	312 (W) x 198 (H) x 316 (D) mm
Net Weight	12.5 kg (approx.)
Shipping weight	14 kg (approx.)
Control Complement	Microwave Power for Variable Cooking Power level MAX ..... Full power throughout the cooking time MED.-HIGH ..... approx. 80% of Full power MEDIUM ..... approx. 60% of Full power DEFROST ..... approx. 40% of Full power LOW/WARM..... approx. 20% of Full power Grill, COMBI
Nameplate Location	 Back side
Accessories	Owner's manual & Cooking guide Glass turntable Rotating ring Grill rack
This microwave oven is designed for household use only. It is not recommended for commercial purposes.	

CAUTIONS

Unlike other appliances, the microwave oven is high-voltage and high-current equipment. Though it is free from danger in ordinary use, extreme care should be taken during repair.

- DO NOT operate on a 2-wire extension cord during repair and use.
- NEVER TOUCH any oven components or wiring during operation.
- BEFORE TOUCHING any parts of the oven, always remove the power plug from the outlet.
- For about 30 seconds after the oven stops, an electric charge remains in the high voltage capacitor. When replacing or checking, you must discharge the high voltage capacitor by shorting across the two terminals with an insulated screwdriver.

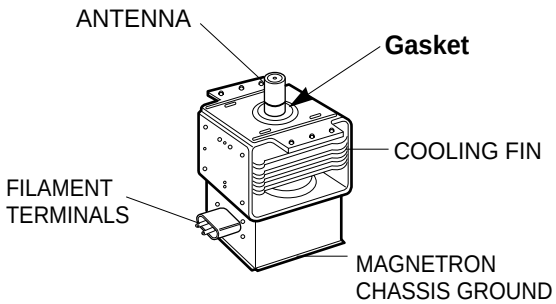


- Remove your watches whenever working close to or replacing the Magnetron.
- NEVER operate the oven with no load.
- NEVER injure the door seal and front plate of the oven cavity.
- NEVER put iron tools on the magnetron.
- NEVER put anything into the latch hole and the interlock switches area.

MICROWAVE RADIATION

Personnel should not be exposed to the microwave energy which may radiate from the magnetron or other microwave generating device if it is improperly used or connection.
All input and output microwave connections, waveguide, flange and gasket must be secure never operate the device without a microwave energy absorbing load attached.
Never look into an open waveguide or antenna while the device is energized.

- Proper operation of the microwave oven requires that the magnetron be assembled to the waveguide and cavity. Never operate the magnetron unless it is properly installed.
- **Be sure that the magnetron gasket is properly installed around the dome of the tube whenever installing the magnetron.**



MAGNETRON

THE OVEN IS TO BE SERVICED ONLY BY PROPERLY QUALIFIED SERVICE PERSONNEL.

INSTALLATIONS

BEFORE YOU BEGIN, READ THE FOLLOWING INSTRUCTIONS COMPLETELY AND CAREFULLY.

INSTALLING

1. Empty the microwave oven and clean inside it with a soft, damp cloth. Check for damage such as misaligned door, damage around the door or dents inside the cavity or on the exterior.

2. Put the oven on a counter, table, or shelf that is strong enough to hold the oven and the food and utensils you put in it. (The control panel side of the oven is the heavy side. Use care when handling.)

3. Do not block the vent and the air intake openings. Blocking vent or air intake openings can cause damage to the oven and poor cooking results. Make sure the microwave oven legs are in place to ensure proper air flow.

4. The oven should not be installed in any area where heat and steam are generated, because they may damage the electronic or mechanical parts of the unit.
   Do not install the oven next to a conventional surface unit or above a conventional wall oven.

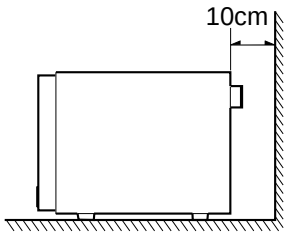
5. Use microwave oven in an ambient temperature less than 104°F(40°C).

6. Place the microwave oven on a sturdy and flat surface at least 10 cm(4 inches) from the wall.

7. Place the microwave oven as far away as possible from TV, RADIO, COMPUTER, etc., to prevent interference.

8. Do not touch the front glass during or after cooking of the Grill and Combination mode.
   This glass is very hot during heater operating.

9. Do not operate the oven at microwave and combination mode with Grill rack placed in the cavity when the oven is empty.



EARTHING INSTRUCTIONS

This microwave oven is designed to be used in a fully earthed condition.
It is imperative, therefore, to make sure it is properly earthed before servicing

WARNING-
THIS APPLIANCE
MUST BE EARTHED

IMPORTANT

The wires in this mains lead are colored in accordance with the following code:

Green-and-yellow:	**Earth**
Blue:	**Neutral**
Brown:	**Live**

As the colors of the wires in the mains lead of this appliance may not correspond with the colored markings identifying the terminals in your plug, proceed as follows.

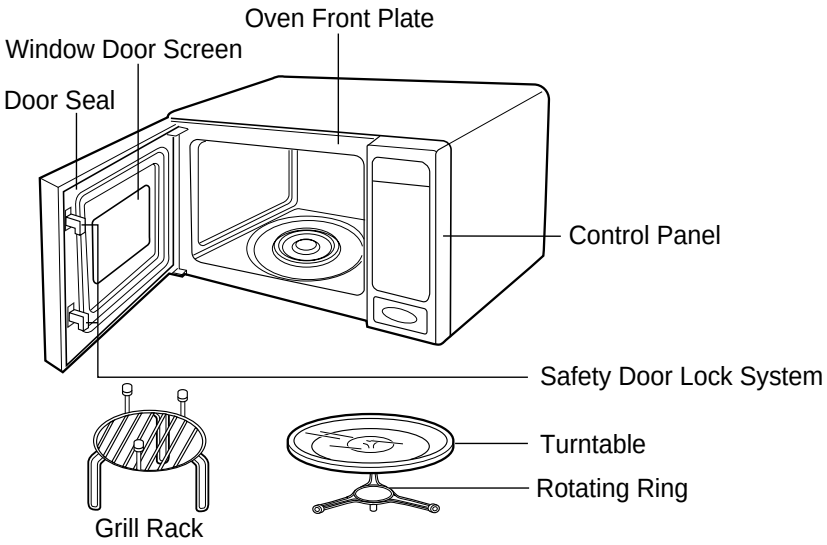
The wire which is colored **green-and-yellow** must be connected to the terminal in the plug which is marked with the letter **E** or by the **earth symbol** (⏚) or colored **green** or **green-and-yellow**.

The wire which is colored **blue** must be connected to the terminal in the plug which is marked with the letter **N** or colored **black**.

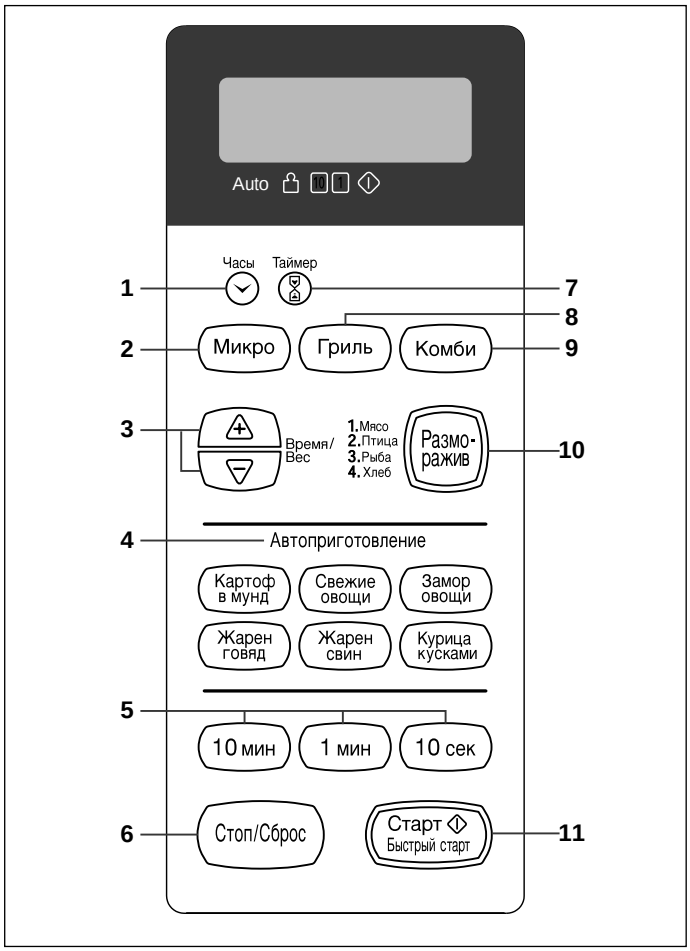
The wire which is colored **brown** must be connected to the terminal in the plug which is marked with the letter **L** or colored **red**.

OPERATING INSTRUCTIONS

FEATURES



CONTROL PANEL

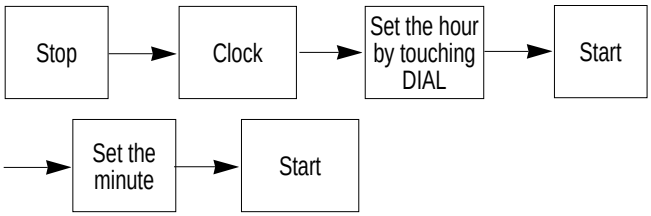


1. **CLOCK:** Used to set the time of day.
2. **POWER:** Used to select the desired power level for cooking.
3. **LESS/MORE:** Used to change cooking time.
4. **AUTO COOK:** Used to cook the foods listed by one touch.
5. **WEIGHT:** Used to select the desired weight.
6. **STOP/CLEAR:** Used to stop oven and clear all entries except time of day.
7. **TIMER:** Touch this pad to use your microwave oven as a kitchen timer.
8. **GRILL:** Used to select the grill cooking.
9. **COMBI:** Used to select the combination cooking.
10. **AUTO DEFROST:** Used to select the auto weight defrost.
11. **START:** One tap allows oven to begin functioning.

OPERATING SEQUENCE

The following is a description of component functions during oven operation.

1. SETTING THE CLOCK

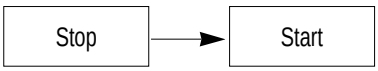


NOTE: You can set 12 hour clock or 24 hour clock optionally.

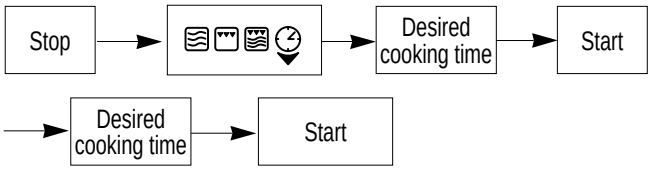
2. CANCEL FUNCTION

Touch the STOP pad whenever you need to cancel an entry or a function currently in use.
The display will either return to the last item entered or to the clock.

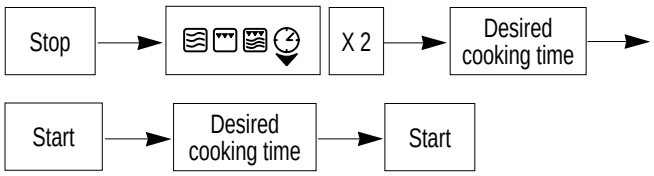
3. QUICK START



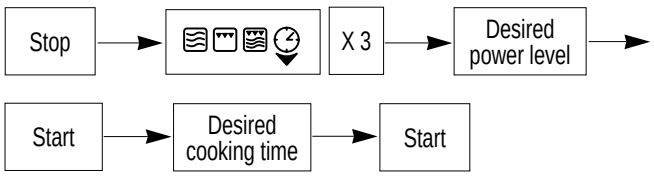
4. MICROWAVE COOKING



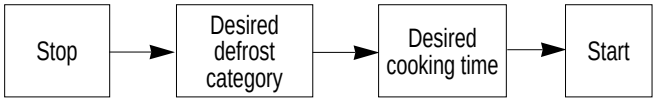
5. GRILL COOKING



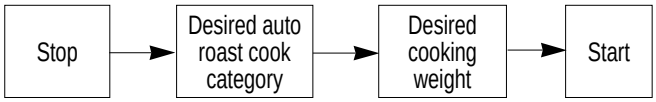
6. COMBI COOKING



7. AUTO WEIGHT DEFROST



8. AUTO ROAST COOK



9. CHILD LOCK

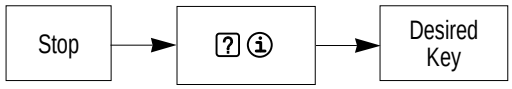
This oven has a CHILD LOCK feature

- TO SET CHILD LOCK
  - Touch the Stop pad
  - Touch STOP pad → **L** appear in the display.

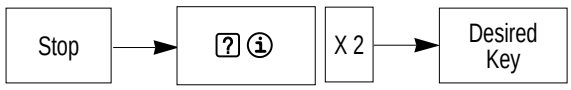
- TO CANCEL CHILD LOCK
  - Touch the Stop pad
  - touch STOP pad → **L** disappears.

10. GUIDE & OPTION

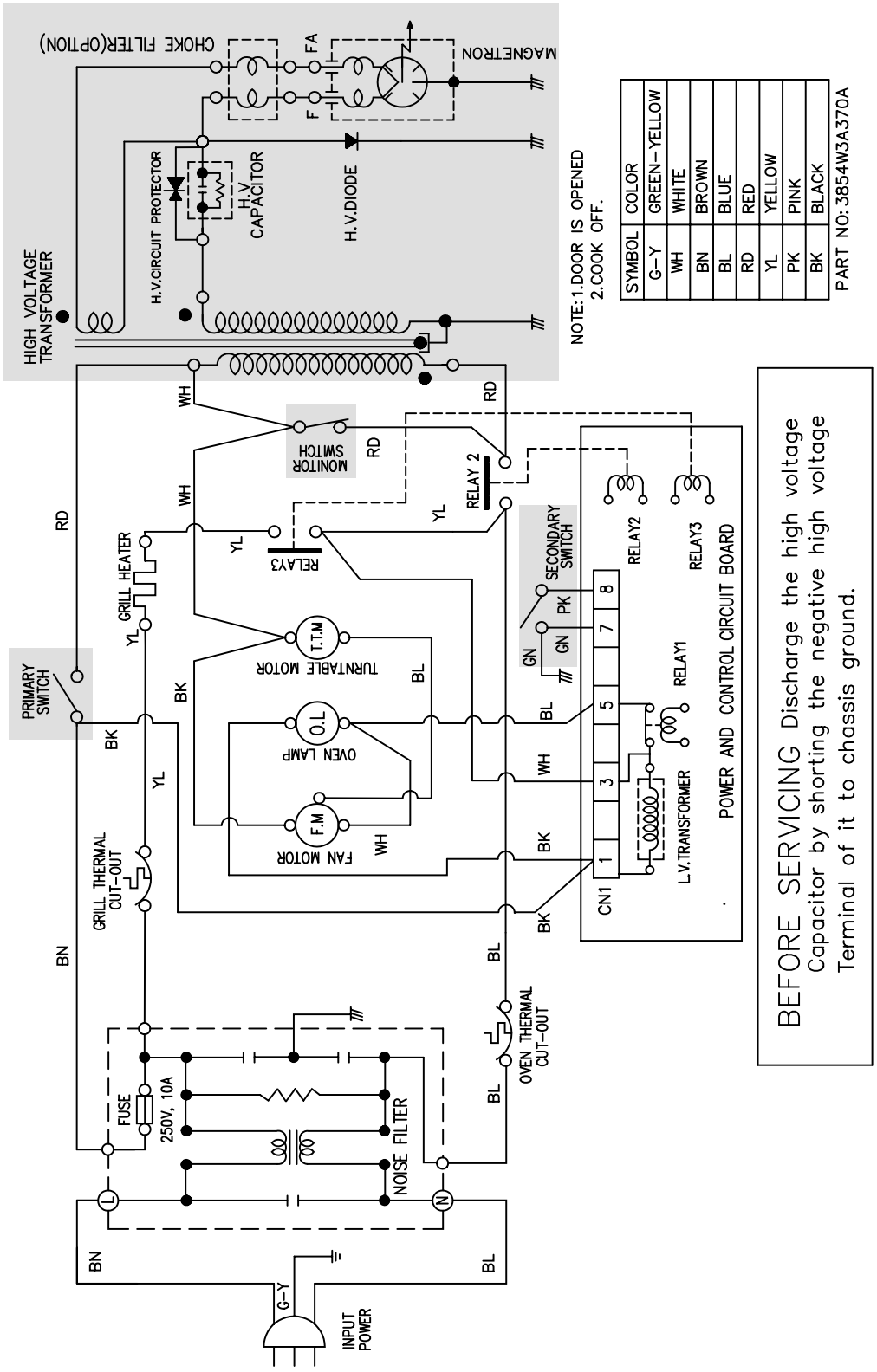
- GUIDE



- OPTION



SCHEMATIC DIAGRAM



CIRCUIT DESCRIPTION

GENERAL DETAILS

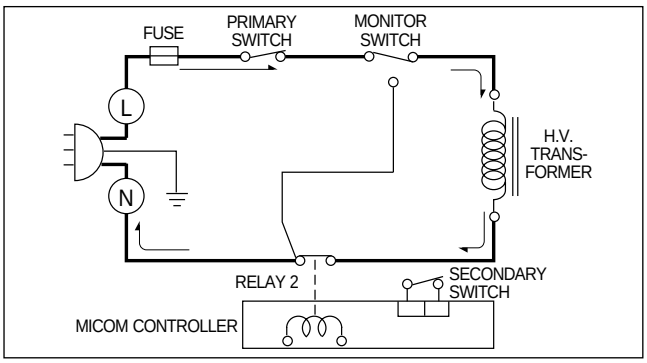
- The low voltage transformer supplies the necessary voltage to the micom controller when power cord is plugged in.
- When the door is closed, the primary switch is ON, the secondary switch is ON, and the monitor switch opens (contact COM and NO).

WHEN SELECTING COOKING POWER LEVEL AND TIME

- The micom controller memorizes the function you set.
- The time you set appears in the display window.
- Each indicator light turns on to indicate that the stage has been set.

WHEN TOUCHING THE START PAD

- The coil of the relay is energized by the micom controller.
- Power input is supplied to the high voltage transformer through the fuse to the primary switch and relay 2.
- Turntable rotates.



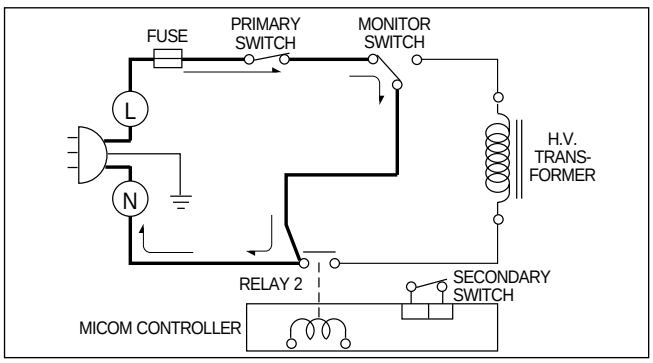
- The fan motor rotates and cools the magnetron by blowing the air (coming from the intake on the baseplate).
- The air is also directed into the oven to exhaust the vapor in the oven through the upper plate.
- Cooking time starts counting down.
- 3.2 volts AC is generated from the filament winding of the high voltage transformer. This 3.2 volts is applied to the magnetron to heat the magnetron filament through two noise-preventing choke coils.
- A high voltage of approximately 2100 volts AC is generated in the secondary of the high voltage transformer which is increased by the action of the high voltage diode and charging of the high voltage capacitor.
- The negative 4,000 Volts DC is applied to the filament of the magnetron.

WHEN THE OVEN IS SET AT ANY LEVEL EXCEPT MAXIMUM.

- The micom controller controls the ON-OFF time of relay 2 by the applied signal to vary the average output power of microwave oven as POWER LEVEL. (refer to page 1-1)
- One complete cycle of relay 2 is 22 seconds.

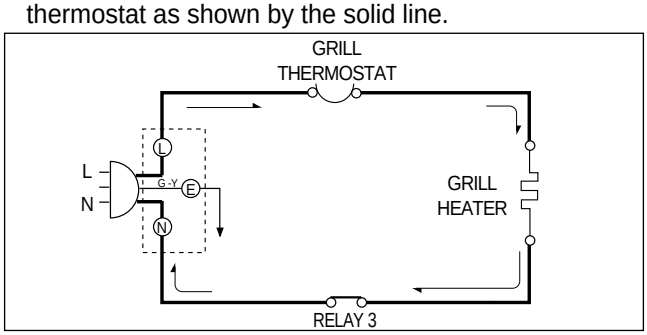
WHEN THE DOOR IS OPENED DURING COOKING

- Both the primary switch and relay 2 are cut off primary winding voltage of the high voltage transformer.
- ON-OFF of relay 2 is coupled electrically with opening and closing of the secondary switch.
- When the door is opened, the secondary switch is opened and when the door is closed, the secondary switch is closed.
- The cooking time stops counting down.
- Relay stops functioning.
- As the door is opened, if the contact of primary switch fails to open, the fuse opens due to the large current surge caused by the monitor switch activation, which in turn stops magnetron oscillation.



WHEN TOUCHING THE START KEY WITH THE GRILL COOKING FUNCTION SELECTED

- The contacts of the primary switch and the secondary switch close the circuit.
- A.C. voltage is applied to the grill heater through grill thermostat as shown by the solid line.



- Turntable rotates.
- The fan motor rotates.
- The air is also directed into the oven to exhaust the vapor in the oven through the base plate and upper plate.

SERVICE INFORMATION

TOOLS AND MEASURING INSTRUMENTS

NECESSARY TOOLS

Tools normally used for TV servicing are sufficient.
Standard tools are listed below.

- Diagonal pliers
- Long nose pliers
- Phillips screwdriver
- Flat blade screwdriver
- Wrench (size 5mm)
- Nutdriver (size 5mm)
- Adjustable wrench
- Soldering iron
- Solder
- Vinyl insulation tape
- Polishing cloth

NECESSARY MEASURING INSTRUMENTS

- TESTER(VOLTS-DC, AC., Ohmmeter)
- Microwave survey meter
  - Holaday HI-1500
    HI-1501
  - Narda 8100
    8200
- Inch scale
- 600 cc non conductive material beaker (glass or plastic), inside diameter: approx. 8.5 cm($3^1/2$ in.)
- Cylindrical and made of borosilicate glass vessel.
  max. thickness: 3 mm
  outside diameter: approx. 190mm
  height: approx. 90mm
- Glass thermometer: 100°C or 212°F (1 deg scale)

MICROWAVE LEAKAGE TEST

CAUTIONS

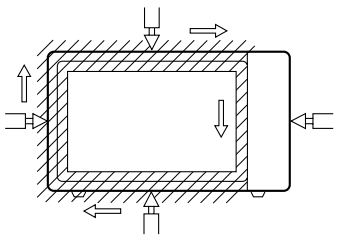
- **Be sure to check microwave leakage prior to servicing the oven if the oven is operative prior to servicing.**
- **The service personnel should inform the manufacture importer, or assembler of any certified oven unit found to have a microwave emission level in excess of 5 mW/cm²** and should repair any unit found to have excessive emission levels at no cost to the owner and should ascertain the cause of the excessive leakage. The service personnel should instruct the owner not to use the unit until the oven has been brought into compliance.
- **If the oven operates with the door open, the service personnel should:**
  - Tell the user not to operate the oven.
  - Contact the manufacturer.
- The service personnel should check all surface and vent openings for microwave leakage.
- Check for microwave leakage after every servicing. The power density of the microwave radiation leakage emitted by the microwave oven should not exceed 4 mW/cm². Always start measuring of an unknown field to assure safety for operating personnel from radiation leakage.

MEASURING MICROWAVE ENERGY LEAKAGE

- **Pour 275±15cc of 20±5°C(68±9°F) water in a beaker which is graduated to 600 cc, and place the beaker on the center of the turntable.**
- **Set the energy leakage monitor to 2,450 MHz and use it following the manufacturer's recommended test procedure to assure correct result.**
- **When measuring the leakage, always use the 2-inch (5cm) spacer supplied with the probe.**
- **Operate the oven at its maximum output.**
- **Measure the microwave radiation using and electromagnetic radiation monitor by holding the probe perpendicular to the surface being measured**

Move probe along shaded area

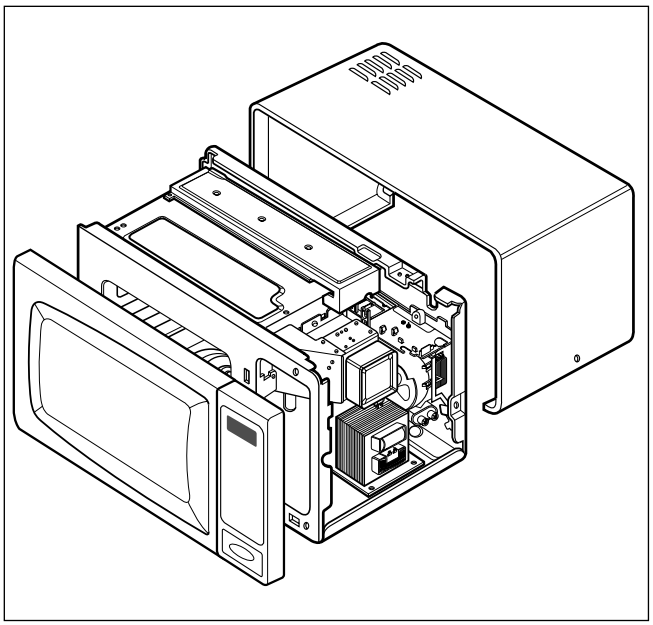
Probe scanning speed
Less than 2.5 cm/sec
(1in/sec)



MEASUREMENT WITH OUTER CASE REMOVED

• When you replace the magnetron, measure for microwave energy leakage before the outer case is installed and after all necessary components are replaced or adjusted.
Special care should be taken in measuring the following parts. (Circled area of below Fig.)
- Around the magnetron
- The waveguide

WARNING : AVOID CONTACTING ANY HIGH VOLTAGE PARTS



MEASUREMENT WITH A FULLY ASSEMBLED OVEN

• After all components, including the outer case, are fully assembled, measure for microwave energy leakage around the door viewing window, the exhaust opening, and air inlet openings.
• Microwave energy leakage must not exceed the values prescribed below.

NOTE: Leakage with the outer case removedless than 5 mW/cm.sq. Leakage for a fully assembled oven (Before the latch switch (primary) is interrupted) with the door in a slightly opened position-less than 2 mW/cm.sq.

NOTES WHEN MEASURING

• Do not exceed meter full scale deflection.
• The test probe must be removed no faster than 1 inch/sec (2.5 cm/sec) along the shaded area, otherwise a false reading may result.
• The test probe must be held with the grip portion of the handle.
A false reading may result if the operator's hand is between the handle and the probe.
• When testing near a corner of the door, keep the probe perpendicular to the surface making sure the probe horizontally along the oven surface, this may possibly cause probe damage.

RECORD KEEPING AND NOTIFICATION AFTER MEASUREMENT

• After adjustment and repair of any microwave energy interruption or microwave energy blocking device, record the measured values for future reference. Also enter the information on the service invoice.
• The microwave energy leakage should not be more than 4 mW/cm.sq. after determining that all parts are in good condition, functioning properly and genuine replacement parts which are listed in this manual have been used.
• At least once a year, have the electromagnetic energy leakage monitor checked for calibration by its manufacturer.

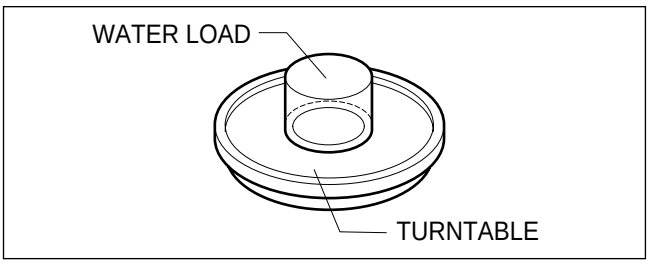
MEASUREMENT OF MICROWAVE POWER OUTPUT

- Microwave power output measurement is made with the microwave oven supplied at its rated voltage and operated at its maximum microwave power setting with a load of (1000±5) g of potable water.
- The water is contained in a cylindrical borosilicate glass vessel having a maximum material thickness of 3 mm and an outside diameter of approximately 190mm.
- The oven and the empty vessel are at ambient temperature prior to the start of the test.
- The initial temperature (T1) of the water is (10±2)°C It is measured immediately before the water is added to the vessel. After addition of the water to the vessel, the load is immediately placed on the center of the turntable which is in the lowest position and the microwave power switched on.
- The time T for the temperature of the water to rise by a value Δ T of (10±2)°K is measured, where T is the time in seconds and ΔT is the temperature rise. The initial and final water temperatures are selected so that the maximum difference between the final water temperature and the ambient temperature is 5°K.
- The microwave power output P in watts is calculated from the following formula :

$$P = \frac{4187 \times (\Delta T)}{T}$$

is measured while the microwave generator is operating at full power. Magnetron filament heat-up time is not included. (about 3 sec)

- The water is stirred to equalize temperature throughout the vessel, prior to measuring the final water temperature.
- Stirring devices and measuring instruments are selected in order to minimize addition or removal of heat.



DISASSEMBLY AND ADJUSTMENT

A. OUTER CASE REMOVAL

1) Disconnect the power supply cord from the outlet.
2) Remove the screws from the rear and along side edges of the case.
   The outer case must be moved backward to be lifted off.

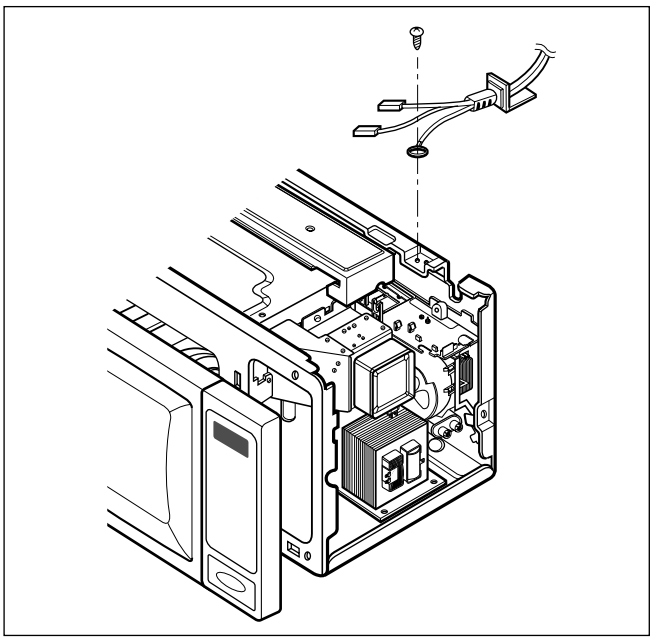
B. POWER SUPPLY CORD

1) Remove the outer case.
2) Disconnect two terminals, and remove one screw of the earth terminal.

CAUTION: DISCHARGE THE HIGH VOLTAGE CAPACITOR BEFORE SERVICING
(refer to page 2-1)

C. CONTROL PANEL ASSEMBLY

1) Disconnect the leadwire from the PCB SUB ASS'Y.
2) Remove the screws for the earth and securing the control panel.
3) Lift control panel ASS'Y from the oven by the tab unhooked.



D. DOOR GROSS ASSEMBLY REMOVAL

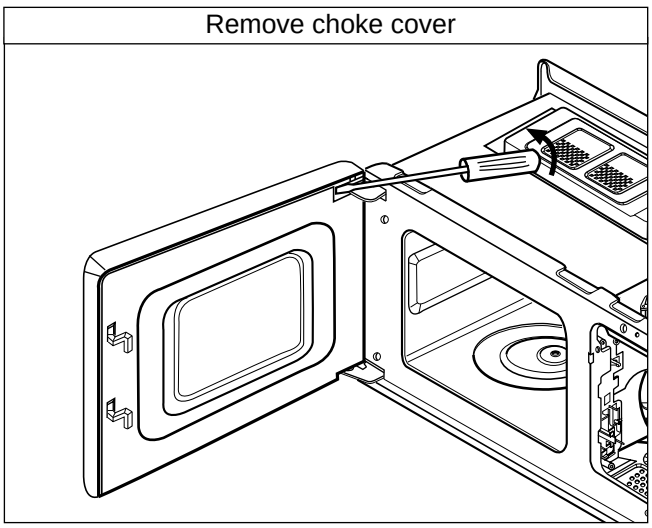
1) Open the door.
2) Remove the choke cover very carefully with a flat-blade screwdriver.

CAUTION : Be careful not to damage door seal plate by screwdriver.

3) Lift up and push the door.

NOTE:

1. After replacing the door, be sure to check that the primary switch, monitor switch, and secondary switch operate normally.
2. After replacing the door, check for microwave energy leakage with a survey meter. Microwave energy must be below the limit of 5 mW/cm. (with a 275 ml water load)
3. When mounting the door assembly to the oven assembly, be sure to adjust the door assembly parallel to the chassis. Also adjust so the door has no play between the inner door surface and oven frame assembly. If the door assembly is not mounted properly, microwaves may leak from the clearance between the door and the oven.



E. HIGH VOLTAGE TRANSFORMER REMOVAL

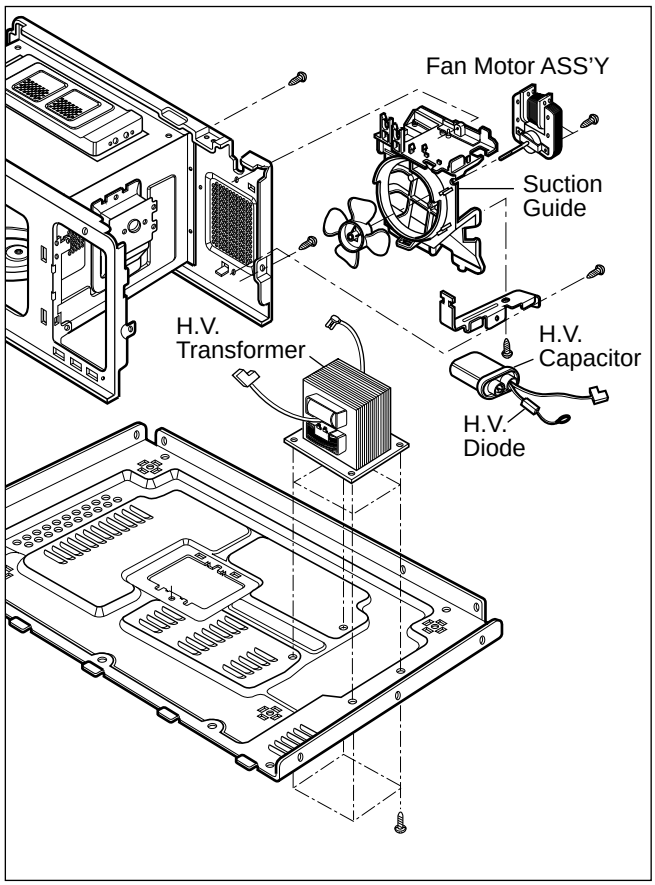
1) Discharge the high voltage capacitor.
2) Disconnect the leadwire from magnetron, high voltage transformer, and capacitor.
3) Remove the screw holding the high voltage transformer to the baseplate.

F. FAN MOTOR ASSEMBLY REMOVAL

1) Discharge the high voltage capacitor.
2) Disconnect the leadwire from fan motor, noise filter and high voltage capacitor.
3) Remove the two screws holding the the suction guide ASS'Y to the oven cavity and remove the high voltage diode earth screw.
4) Remove the screw of the capacitor bracket.
5) Remove the two screws holding the fan motor ASS'Y to the suction guide ASS'Y.

G. HIGH VOLTAGE CAPACITOR AND DIODE REMOVAL

1) Discharge the high voltage capacitor.
2) Disconnect the leadwire from fan motor, noise filter and high voltage capacitor.
3) Remove the screw holding the suction guide ASS'Y to the oven cavity and remove the high voltage diode earth screw.
4) Remove the screw holding the high voltage capacitor bracket.



H. AIR DUCT ASSEMBLY REMOVAL

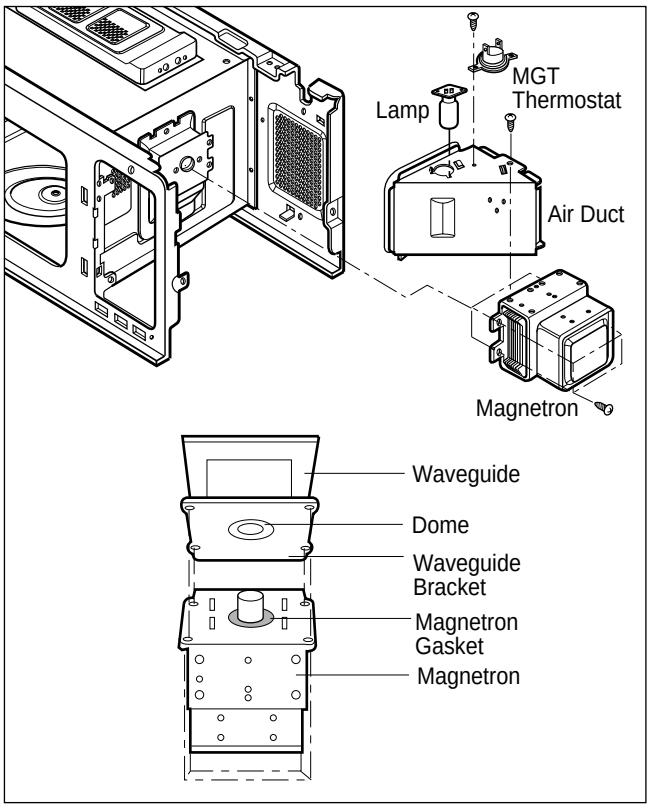
1) Disconnect the leadwire from lamp and MGT thermostat.
2) Remove the mounting screw to the magnetron.

I. MAGNETRON REMOVAL

1) Disconnect the leadwire from the high voltage transformer and high voltage capacitor.
2) Carefully remove the mounting screws holding the magnetron and the waveguide.
3) Remove the magnetron ASS'Y until the tube is clear from the waveguide.

NOTE:

1. When removing the magnetron, make sure its dome does not hit any adjacent parts, or it may be damaged.
2. When replacing the magnetron, be sure to install the magnetron gasket in the correct position and be sure that the gasket is in good condition.
3. After replacing the magnetron, check for microwave leakage with a survey meter around the magnetron. Microwave energy must be below the limit of 5 mW/cm^2. (With a 275 ml. water load). **Make sure that gasket is rigidly attached to the magnetron.** To prevent microwave leakage, tighten the mounting screws properly, making sure there is no gap between the waveguide and the magnetron.

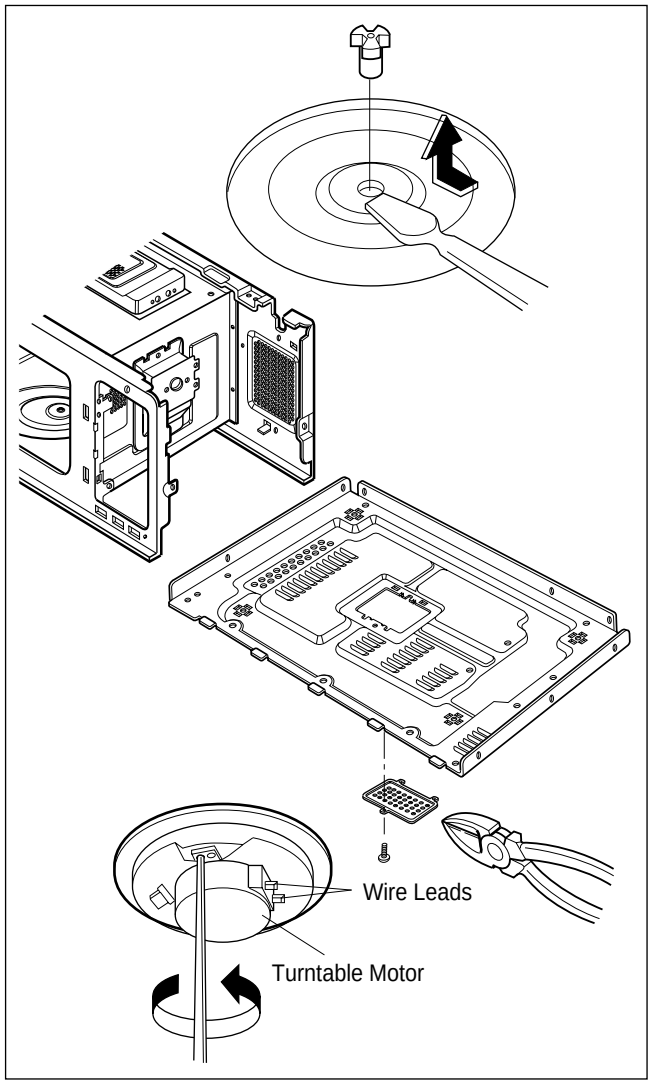


J. REMOVING THE TURNTABLE MOTOR

1) Remove the turntable.
2) Remove the turntable shaft VERY CAREFULLY with a slotted screwdriver.
3) Lay the unit down on its back.
4) Remove the turntable motor cover.
   The turntable base cover is easily removed by pinching the six parts with a wire cutting.
5) Disconnect the leadwire from the turntable motor terminals.
6) Remove the screw securing the turntable motor to the oven cavity ASS'Y
7) After repairing the motor, rotate the removed turntable motor cover.
8) Fit the turntable motor cover's projecting part to the base plate slit.

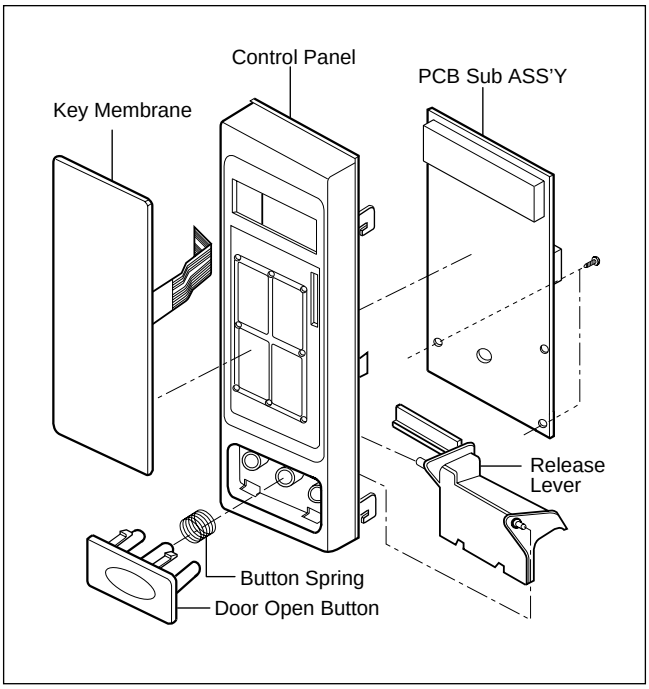
NOTE:

1. Remove the wire lead from the turntable motor VERY CAREFULLY.
2. Be sure to grasp the connector, not the wires, when removing.



K. PCB ASSEMBLY REMOVAL

1) Remove the control panel assembly from the cavity. (Refer to control panel assembly removal on previous page.)
2) Remove screws which hold the PCB SUB ASS'Y to the control panel.
3) Disconnect the flat cable from the PCB SUB ASS'Y and take off the PCB SUB ASS'Y.

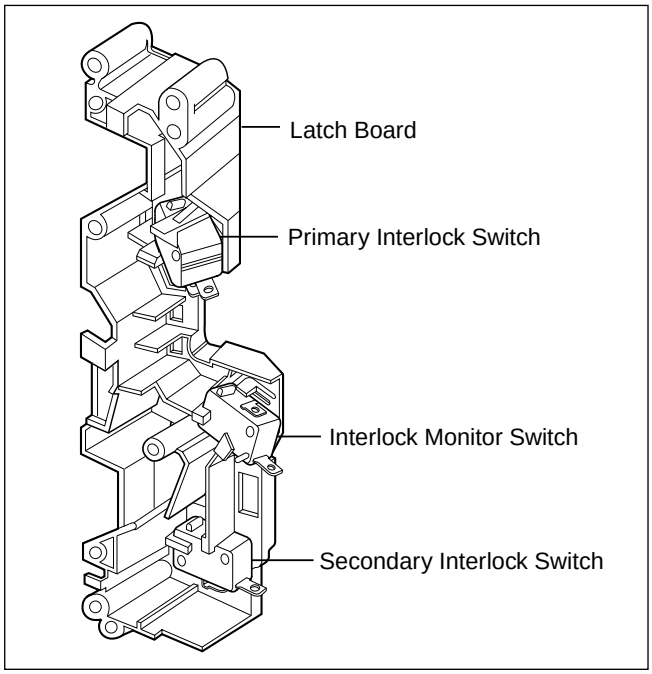


L. INTERLOCK SYSTEM

1) INTERLOCK MECHANISM

The door lock mechanism is a device which has been specially designed to eliminate completely microwave activity when the door is opened during cooking and thus to prevent the danger resulting from the microwave leakage.

2) MOUNTING OF THE PRIMARY/MONITOR/ SECONDARY SWITCHES TO THE LATCH BOARD



3) INSTALLATION AND ADJUSTMENT OF THE LATCH BOARD TO THE OVEN ASSEMBLY

- Mount the latch board to the oven assembly.
- Adjust the latch board in the arrow direction so that oven door will not have any play in it when the door is closed.
- Tighten the mounting screw.
- **Check for play in the door by pushing the door release button. Door movement should be less than 0.5 mm. (1/64 inch)**

Don't push the door release button while making adjustment. Make sure that the latch moves smoothly after adjustment are completed and that the screws are tight. Make sure the primary, monitor, and secondary switches operate properly by following the continuity test procedure.

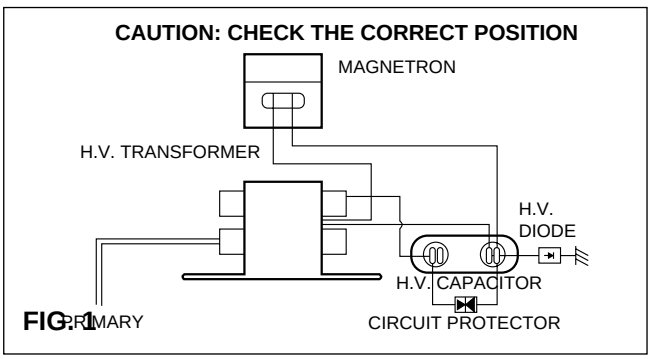


FIG. 1

INTERLOCK CONTINUITY TEST

WARNING : FOR CONTINUED PROTECTION AGAINST EXCESSIVE RADIATION EMISSION, REPLACE ONLY WITH IDENTICAL REPLACEMENT PARTS.

TYPE NO. SZM-V 16-FA-63 OR VP-533A-OF FOR PRIMARY SWITCH
TYPE NO. SZM-V 16-FA-61 OR VP-531A-OF FOR MONITOR SWITCH
TYPE NO. SZM-V 16-FA-63 OR VP-533A-OF FOR SECONDARY SWITCH

A. PRIMARY INTERLOCK SWITCH TEST

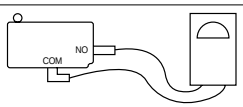
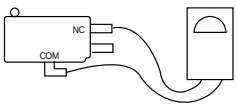
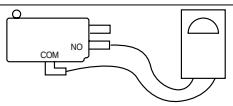
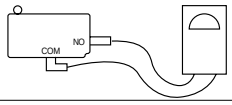
When the door release button is depressed slowly with the door closed, an audible **click** should be heard at the same time or successively at intervals. When the button is released slowly, the latches should activate the switches with an audible **click**.
If the latches do not activate the switches when the door is closed, the switches should be a adjusted in accordance with the adjustment procedure. Disconnect the wire lead from the primary switch. Connect the ohmmeter leads to the common (COM) and normally open (NO) terminal of the switch. The meter should indicate an open circuit in the door open condition. When the door is closed, the meter should indicate a closed circuit.
When the primary switch operation is abnormal, make the necessary adjustment or replace the switch only with the same type of switch.

B. SECONDARY INTERLOCK SWITCH TEST

Disconnect the wire lead from the secondary switch.
Connect the ohmmeter leads to the common (COM) and normally open (NO) terminals of the switch. The meter should indicate a open circuit in the door open condition. When the door is closed, meter should indicate an closed circuit. When the secondary switch operation is abnormal, make the necessary adjustment or replace the switch only with the same type of switch.

C. MONITOR SWITCH TEST

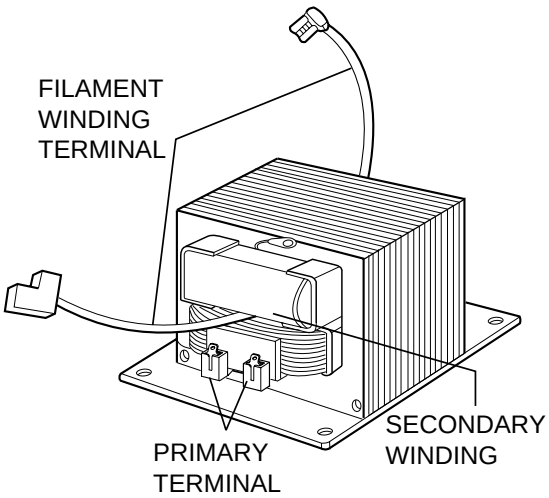
Disconnect the wire lead from the monitor switch. Connect the ohmmeter leads to the common (COM) and normally closed (NC) terminals of the switch. The meter should indicate closed circuit in the door open condition. When the door is closed, meter should indicate an open circuit. When the monitor switch operation is abnormal, replace with the same type of switch.
NOTE: After repairing the door or the interlock system, it is necessary to do this continuity test before operating the oven.

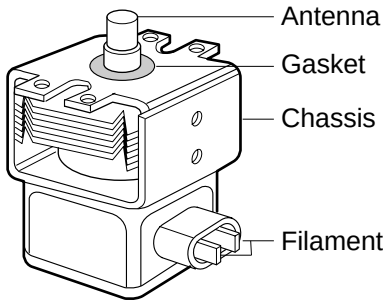
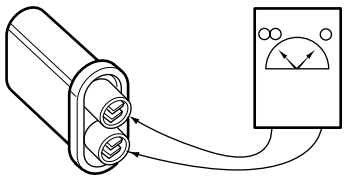
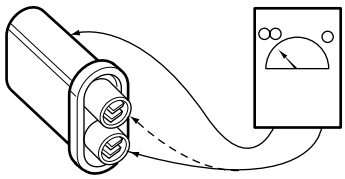
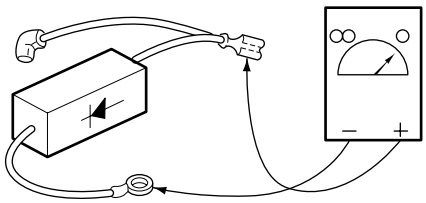
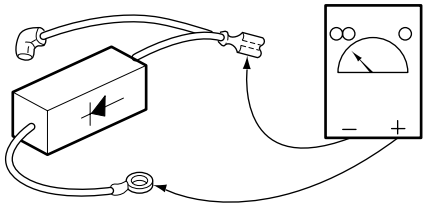
COMPONENTS	TEST PROCEDURE		RESULTS	
SWITCHES (Wire leads removed)	Check for continuity of the switch with an Ohm-meter		Door open	Door closed
	Primary Switch			
	Monitor Switch			
				
	Secondary Switch			
	NOTE : After checking for the continuity of switches, make sure that are connected correctly.			

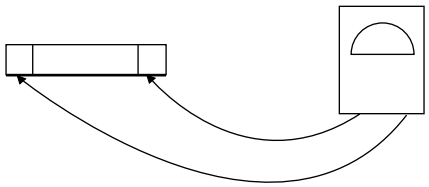
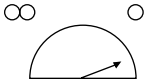
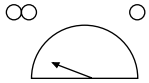
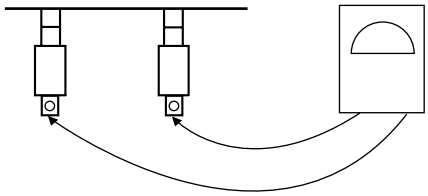
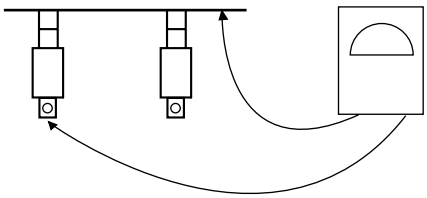
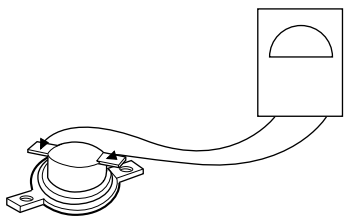
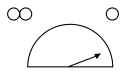
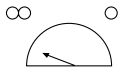
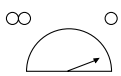
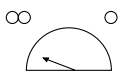
COMPONENT TEST PROCEDURE

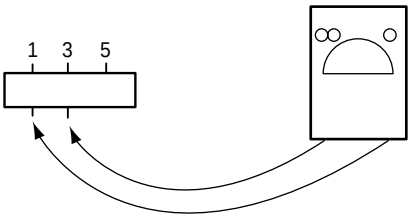
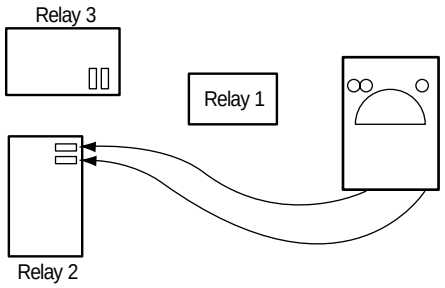
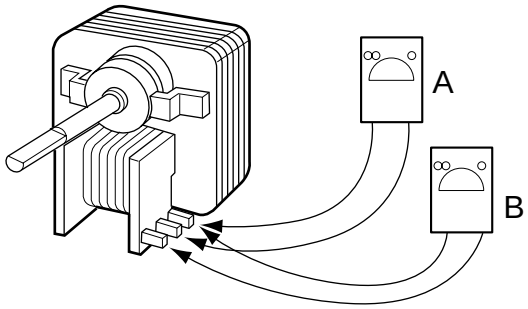
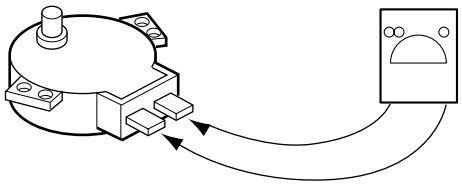
CAUTIONS

1. DISCONNECT THE POWER SUPPLY CORD FROM THE OUTLET WHENEVER REMOVING THE OUTER CASE FROM THE UNIT. PROCEED WITH THE TEST ONLY AFTER DISCHARGING THE HIGH VOLTAGE CAPACITOR AND REMOVING THE WIRE LEADS FROM THE PRIMARY WINDING OF THE HIGH VOLTAGE TRANSFORMER. (SEE PAGE 2-1)
2. ALL OPERATIONAL CHECKS WITH MICROWAVE ENERGY MUST BE DONE WITH A LOAD (1 LITER OF WATER IN CONTAINER) IN THE OVEN.

COMPONENTS	TEST PROCEDURE	RESULTS
HIGH VOLTAGE TRANSFORMER (Wire leads removed)	 1. Measure the resistance. (Ohm-meter scale: Rx1 and Rx100) • Primary winding • Secondary winding • Filament winding 2. Measure the resistance. (Ohm-meter scale: Rx1000) • Primary winding to ground • Filament winding to ground	 Approx.: 1.4 ohm Approx.: 90 ohm Less than: 1 ohm Normal: Infinite Normal: Infinite
MAGNETRON (Wire leads removed)	1. Measure the resistance. (Ohm-meter scale: Rx1) • Filament terminal 2. Measure the resistance. (Ohm-meter scale: Rx1000) • Filament to chassis	 Normal: Less than 1 ohm Normal: Infinite

COMPONENTS	TEST PROCEDURE	RESULTS
		
	NOTE: When testing the magnetron, be sure to install the magnetron gasket in the correct position and be sure that the gasket is in good condition.	
HIGH VOLTAGE CAPACITOR	Measure the resistance. (Ohm-meter scale: Rx1000) • Terminal to terminal. 	Normal: Momentarily indicates several ohms, and then gradually returns to infinite.
	Measure the resistance. (Ohm-meter scale: Rx1000) • Terminal to case. 	Normal: Infinite.
HIGH VOLTAGE DIODE NOTE : Some inexpensive meters may indicate infinite resistance in both direction.	Measure the continuity (Forward). (Ohm-meter scale: Rx10000) 	Normal: Continuity. Abnormal: Infinite.
	Measure the continuity (Reverse). (Ohm-meter scale: Rx10000) 	Normal: Infinite. Abnormal: Continuity.

<table>
<tr><th>COMPONENTS</th><th>TEST PROCEDURE</th><th colspan="2">RESULTS</th></tr>
<tr><td rowspan="2">FUSE</td><td>Check for continuity of the fuse with an multi-meter.
  </td><td>Normal
  </td><td>Abnormal
  </td></tr>
<tr><td colspan="3">NOTE: If the fuse is blown, check the primary, the secondary, and the monitor switches, H.V.D. and H.V.C. before replacing the fuse.
If the fuse is blown by improper switch operation replace the defective switch and the fuse at the same time. Replace just the fuse if the switches operate normally.</td></tr>
<tr><td>HEATER ELEMENT
(Wire leads removed.)</td><td>Measure the resistance.
(Multi-meter scale: Rx1)
  </td><td colspan="2">Normal:
*Grill heater
Approx. 38 ohm
(at 20 ~ 30°C)</td></tr>
<tr><td rowspan="2"></td><td>Measure the resistance with 500V-100M ohm insulation resistance meter.
  </td><td colspan="2">Normal: more than 0.5 Mohm</td></tr>
<tr><td colspan="3">NOTE: Make sure heater is fully cooled when tested.</td></tr>
<tr><td>GRILL THERMOSTAT</td><td rowspan="2">  </td><td>0°C~Approx.90°C
  </td><td>Approx.90°C
  </td></tr>
<tr><td>OVEN THERMOSTAT
MAGNETRON
THERMOSTAT</td><td>0°C~Approx.145°C
  </td><td>Approx.145°C
  </td></tr>
</table>

<table>
<tr><th>COMPONENTS</th><th>TEST PROCEDURE</th><th colspan="2">RESULTS</th></tr>
<tr><td rowspan="2">Disconnect the 8 pin connector from P.C.B.
(Refer to schemetic diagram)</td><td rowspan="2">Check for P.C.B. connector.
 
</td><td>Cooking Start</td><td>OFF</td></tr>
<tr><td> </td><td> </td></tr>
<tr><td rowspan="2">RELAY 2, RELAY 3
OF P.C.B.
(Wire leads removed.)
Note: Relay
Relay 1: Fan motor
Turntable motor
Oven lamp
Relay 2: Microwave
Relay 3: Grill</td><td rowspan="2"> 
</td><td>Cooking Start</td><td>OFF</td></tr>
<tr><td> </td><td> </td></tr>
<tr><td>FAN MOTOR
(Wire leads removed)</td><td>Measure the resistance.
(Ohm-meter scale: R x 1)
 
</td><td colspan="2">Normal: Approx. 200 ~400 ohm
<table><tr><td>A</td><td>Approx. 30 ~ 50 ohm</td></tr><tr><td>B</td><td>Approx. 300 ~ 500 ohm</td></tr></table>Abnormal: Infinite or several ohm.</td></tr>
<tr><td>TURNTABLE
MOTOR
(Wire leads removed)</td><td>Measure the resistance.
(Ohm-meter scale: R x 1000)
  </td><td colspan="2">Normal: Approx. 10~20 kohm
Abnormal: Infinite or several ohm.</td></tr>
<tr><td colspan="4">NOTE : • A MICROWAVE LEAKAGE TEST MUST ALWAYS BE PERFORMED WHEN THE UNIT IS SERVICED FOR ANY REASON.
• MAKE SURE THE WIRE LEADS ARE IN THE CORRECT POSITION.
• WHEN REMOVING THE WIRE LEADS FROM THE PARTS, BE SURE TO GRASP THE CONNECTOR, NOT THE WIRES.</td></tr>
</table>

TROUBLE SHOOTING

WHEN YOU GET A COMPLAINT FROM YOUR CUSTOMER, EVALUATE THE COMPLAINT CAREFULLY. IF THE FOLLOWING SYMPTOMS APPLY, PLEASE INSTRUCT THE CUSTOMER IN THE PROPER USE OF THE MICROWAVE OVEN. THIS CAN ELIMINATE AN UNNECESSARY SERVICE CALL.

CAUTIONS

1. Check grounding before checking for trouble.
2. Be careful of the high voltage circuit.
3. Discharge the high voltage capacitor. (See page 2-1)
4. When checking the continuity of the switches or of the high voltage transformer, disconnect one lead wire from these parts and then check continuity with the AC plug removed. To do otherwise may result in a false reading or damage to your meter.
5. Do not touch any part of the circuitry on the digital programmer circuit since static electric discharge may damage this control panel.
   Always touch yourself ground while working on this panel to discharge any static charge built up in your body.

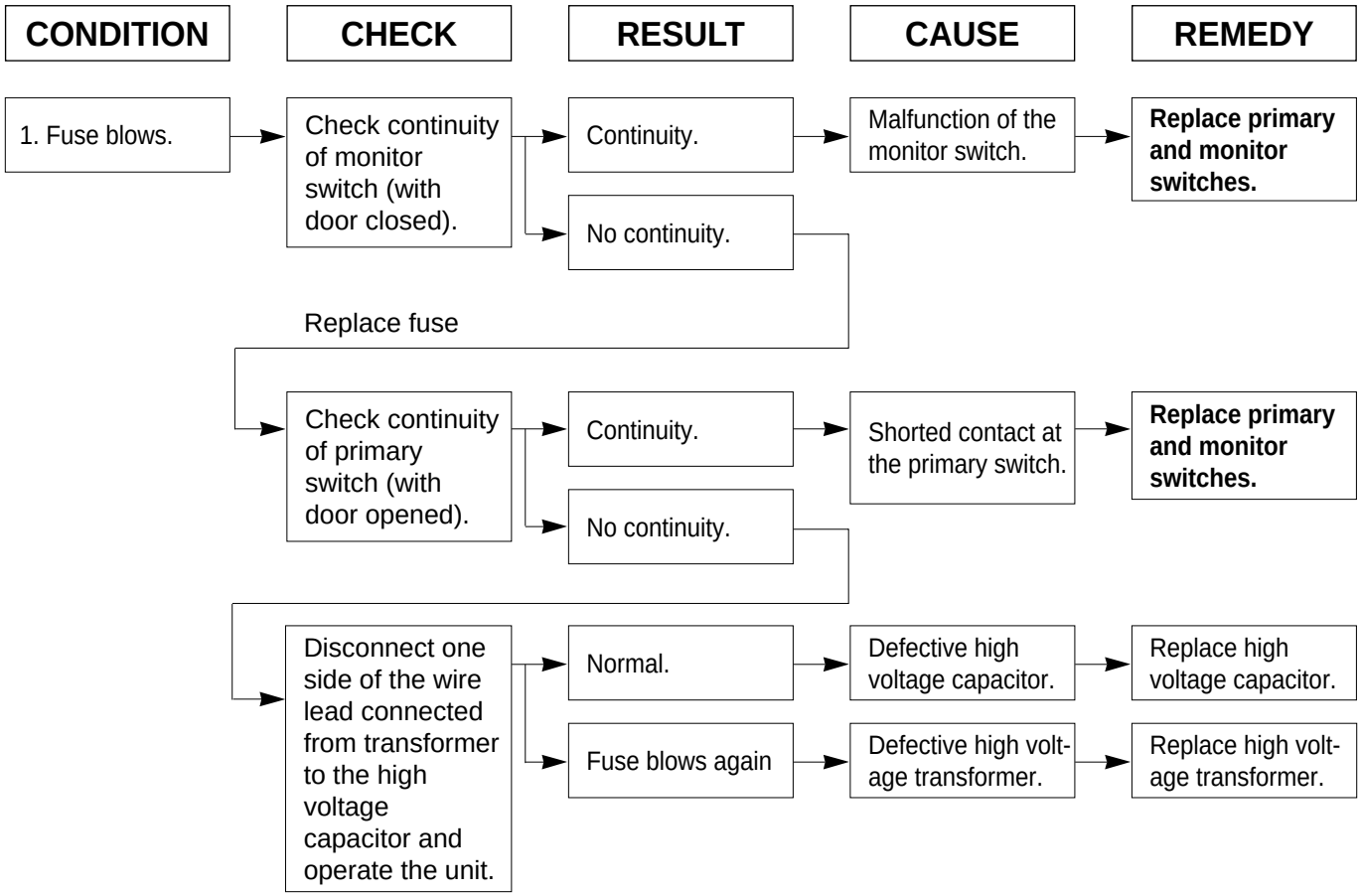
CONDITION	CAUSE	REMEDY
Microwave oven does not work.	Inserting many plug into one plug outlet and using them at the same time (causes overloading).	Avoid using other electrical appliances when you use the microwave oven.
	Microwave oven plug is not inserted tightly.	Insert microwave oven plug securely.
Output power is too low.	Low AC input voltage.	Use the microwave oven at adequate line voltage.
	Food temperature is too low.	This may not be a defect. It is possible that the food should be cooked for a longer time period.
Sparks occurring.	Using metallic ware and allowing it to touch the oven wall.	Do not use metallic ware for cooking except where noted in the cooking guide.
	Ceramic ware trimmed in gold or silver powder is used.	Do not use any type of cookware with metallic trimming.
Uneven cooking.	Inconsistent intensity of microwave by their characteristics.	1. Wrap the thinner part with aluminum foil. 2. Use plastic wrap or lid. 3. Stir once or twice while cooking soup, cocoa or milk, etc.

(TROUBLE 1) The following visual conditions indicate a probable defective control circuit.

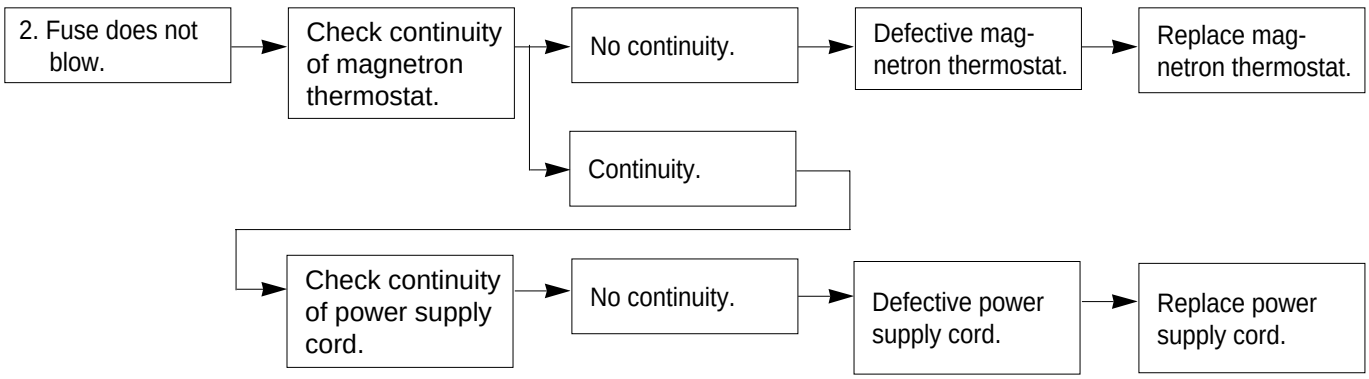
1. Incomplete segments.
   - Segment missing.
   - Partial segment missing.
   - Digit flickering (NOTE: Slight flickering is normal.)
2. Colon does not turn on or blink.
3. A distinct change in the brightness of one or more numbers in display.
4. One or more digits in the display are not lighting.
5. Display indicates a number different from one touched, for example, key in **5** and **3** appears in the display.
6. Specific numbers (for example 7 or 9) will not display when key pad is touched.
7. Display does not count down with time blinking or up with clock operation.
8. Display obviously jumps in time while counting down.
9. Display counts down too fast while cooking.
10. Each indicator light does not turn on after setting cooking cycle.
11. Display time of day does not reappear when cooking is finished.
12. Beep sound is not heard when correct key is touched.

CONDITION	CHECK	RESULT	CAUSE	REMEDY
1. No input can be programmed.	Check the connection between membrane key assembly and PCB assembly.	Continuity.	Defective PCB assembly.	Replace PCB assembly.
		No continuity.	Loose connection.	Connect them tightly.
2. Some inputs cannot be programmed.	Replace key membrane assembly and check operation.	Everything works as specified.	Defective key membrane assembly.	Replace key membrane assembly.
3. Display shows a number or figure different from one touched.		Still have trouble.	Defective PCB assembly.	Replace PCB assembly.
4. Random programming when touching other pads.				
5. Display is fixed at some figure and can not accept any input.				

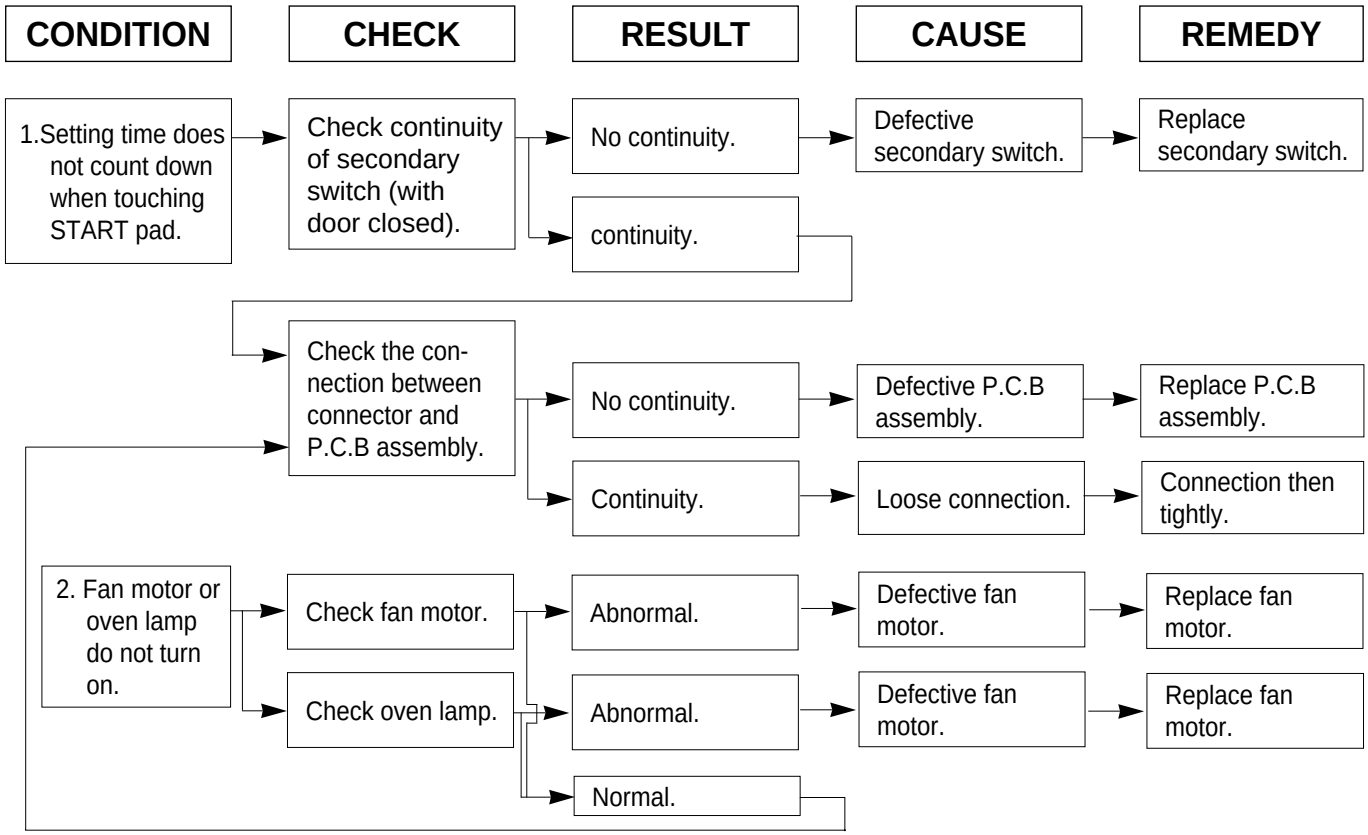
(TROUBLE 2) Oven does not operate at all ; Display window does not display any figures and no input is accepted.



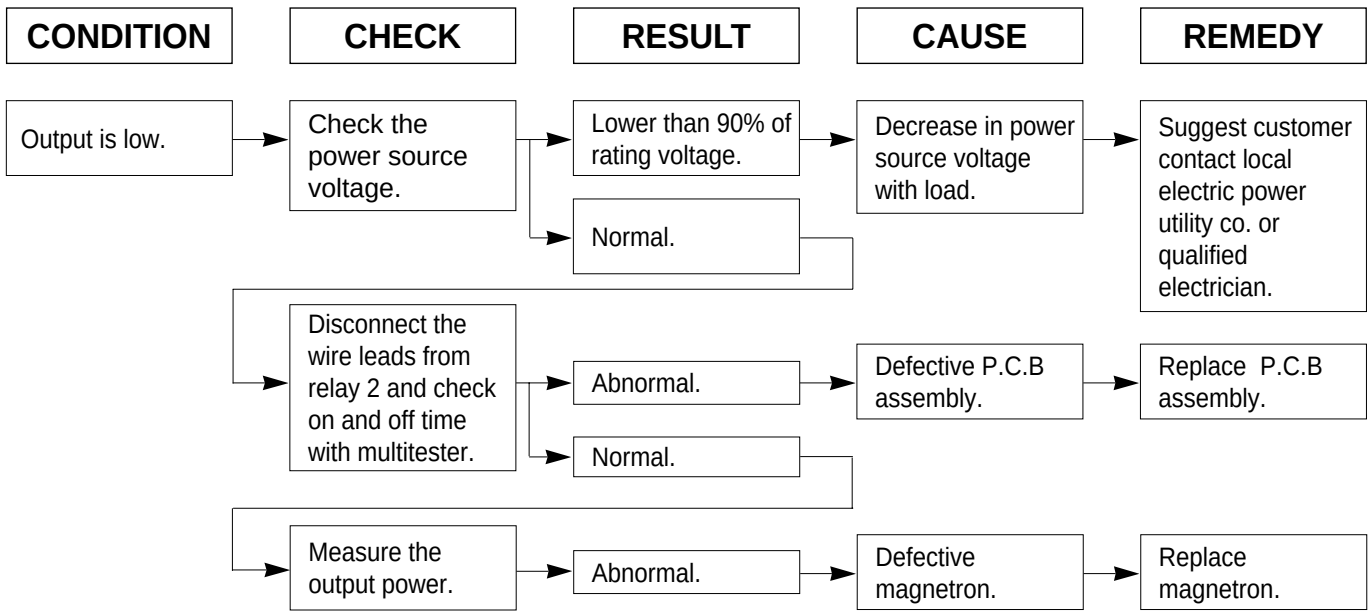
NOTE : All these switches must be replaced at the same time. Refer to page 5-6, 5-7



(TROUBLE 3) Display shows all figures set, but oven does not start cooking while desired program times are set and START pad is touched.

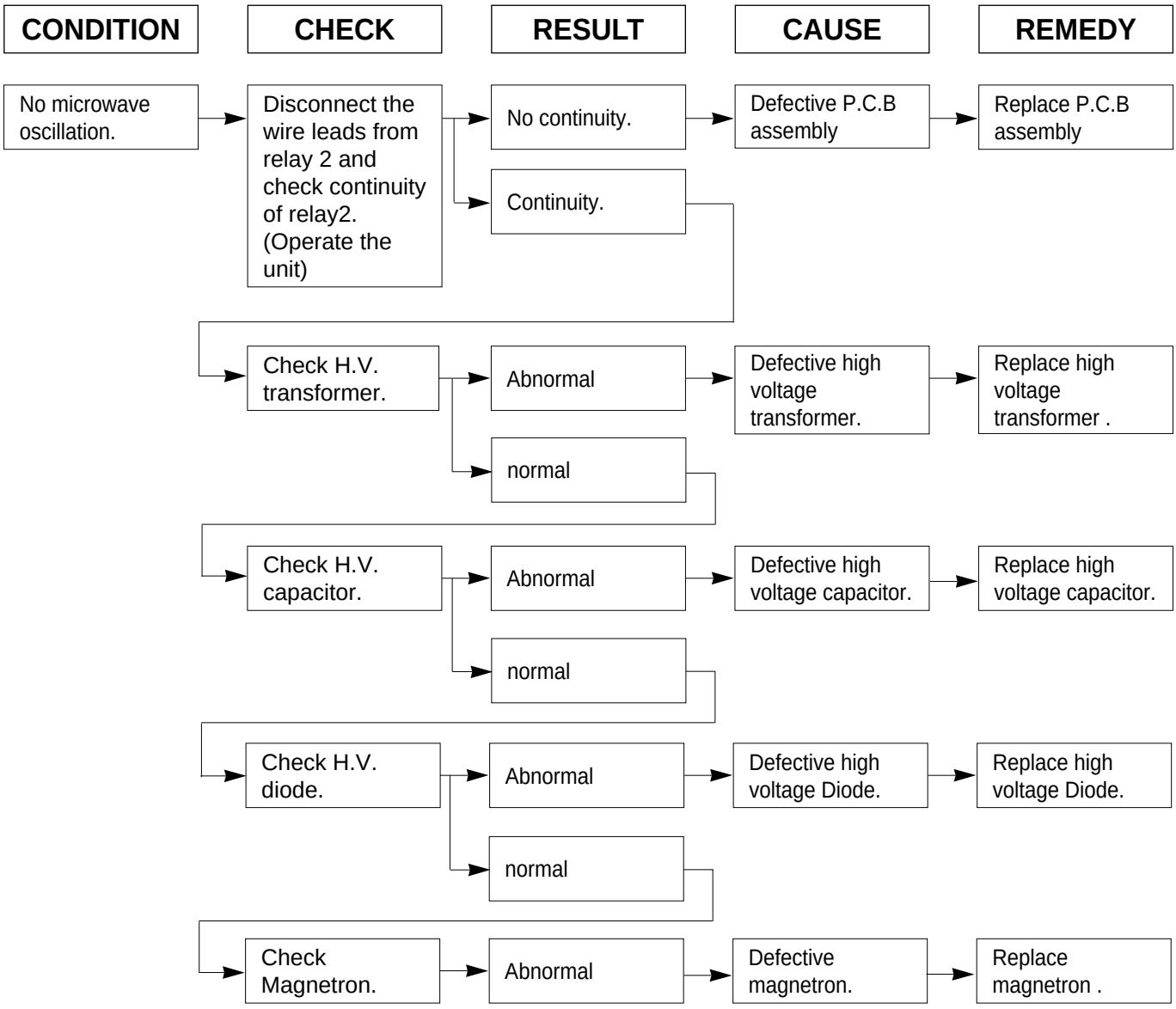


(TROUBLE 4) Oven seems to be operation but little heat is produced in oven load.



NOTE: Simple test of power output-conducted by heating one liter water for one min. if available.

(TROUBLE 5) No microwave oscillation even though oven lamp and fan motor run (Display operates properly)



(TROUBLE 6) Oven does not cook properly when programmed for the set power level (Operates properly on HIGH)

CONDITION	CHECK	RESULT	CAUSE	REMEDY
Output is full when you set lower power level.	Disconnect the wire leads from relay 2 and check continuity relay 2. (Operate the unit)	Abnormal.	Defective P.C.B. assembly.	Replace P.C.B. assembly.

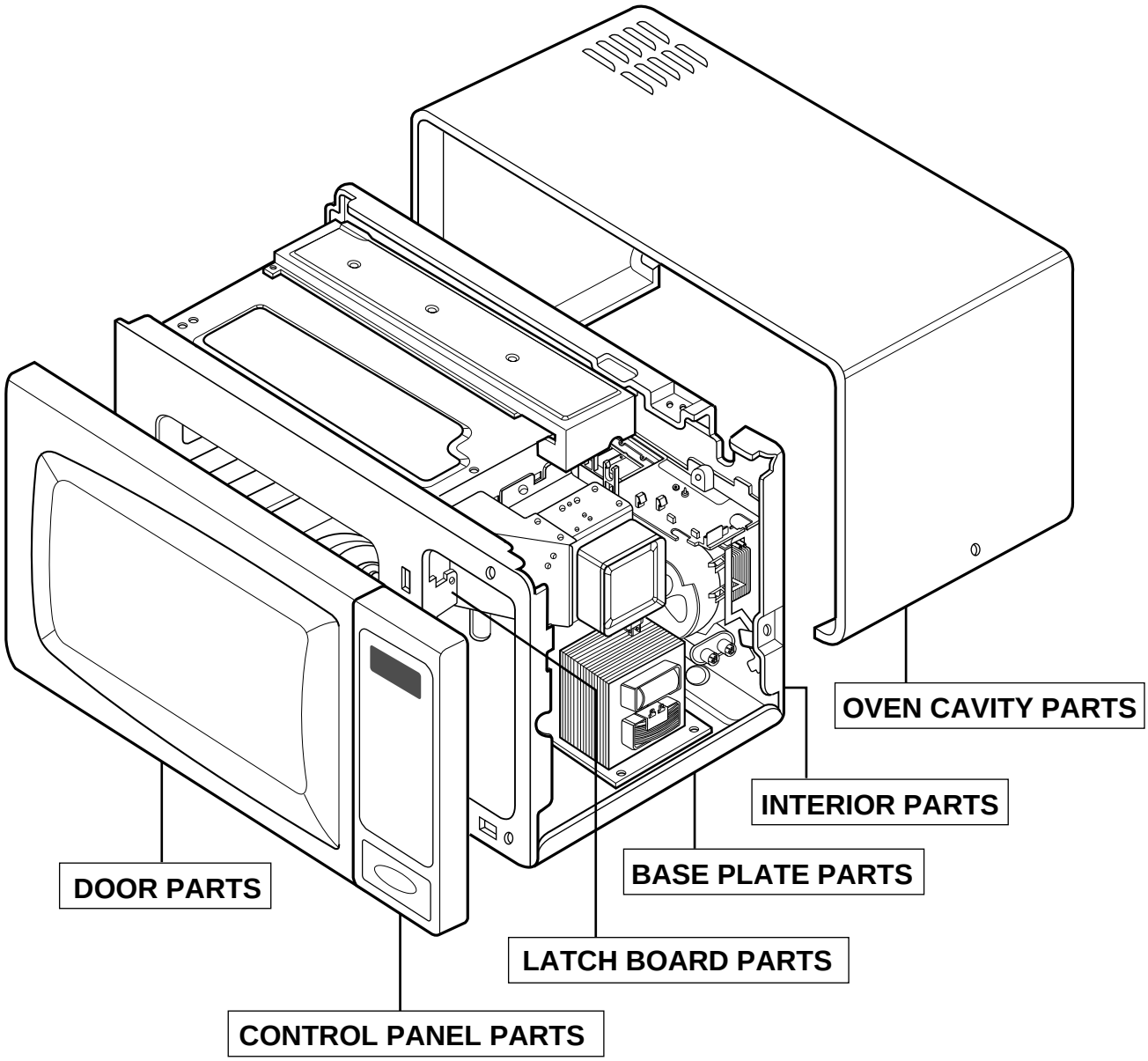
(TROUBLE 7) Grill

CONDITION	CHECK	RESULT	CAUSE	REMEDY
1. Heater is not operating.	Heater.	Abnormal.	Malfunction the heater.	Replace.
		Normal.		
	Thermostat and relay3.(Grill)	Abnormal.	Malfunction the thermostat.	Replace.
		Normal.		
	Wire connection.	No continuity.	Open or loosen.	Replace or connect tightly.
1. Lower temperature the oven.	Heater.	Abnormal.	Malfunction the heater.	Replace.
		Normal.		
	Thermostat and relay3.(Grill)	Abnormal.	Malfunction the thermostat.	Replace.

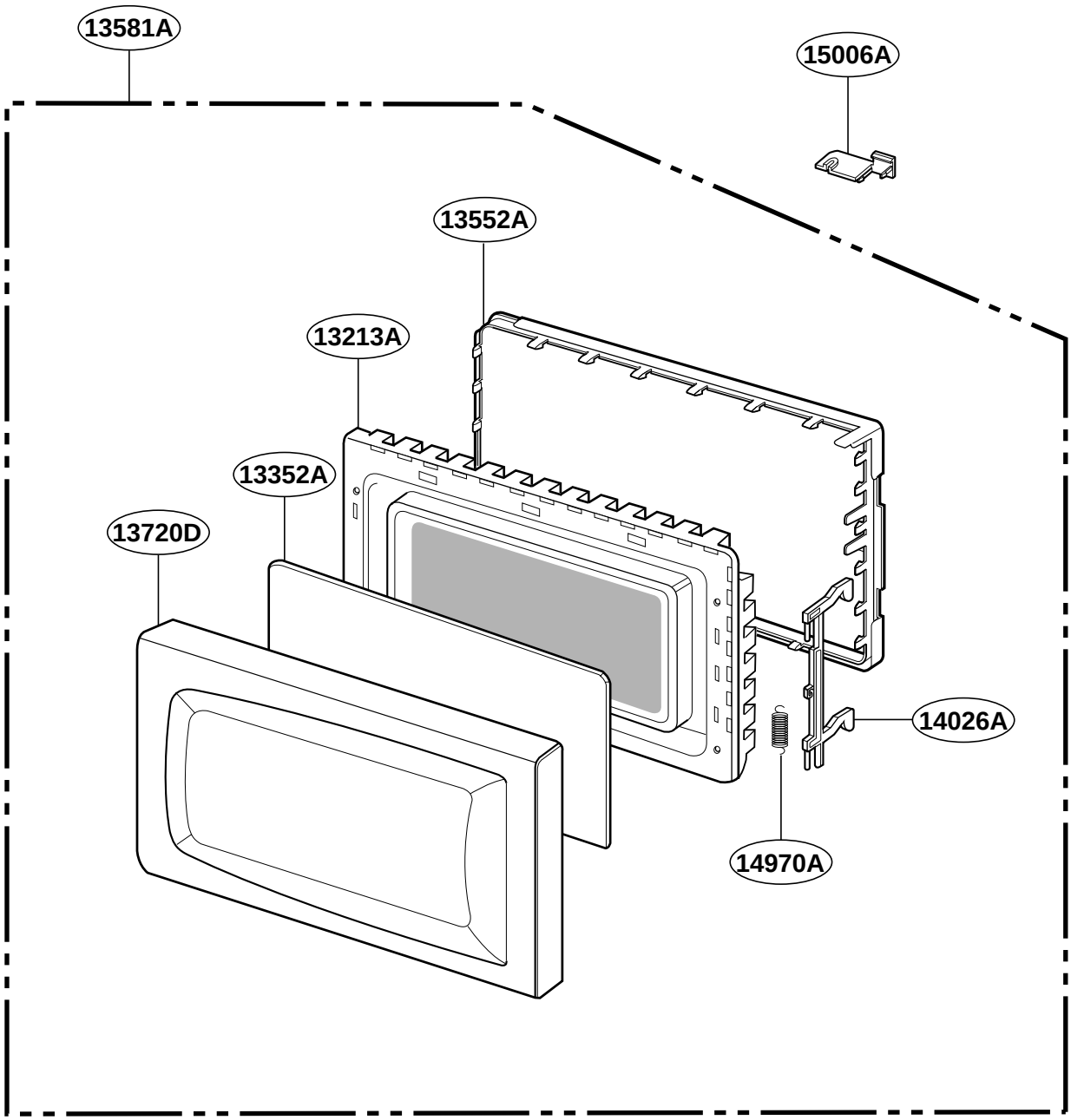
NOTE: * Make sure the wore leads correct position.
* When removing the wire leads from parts be sure to grasp the connector not the wires.
* When removing the magnetron, be sure to install the magnetron gasket in the correct position and in good condition.

EXPLODED VIEW

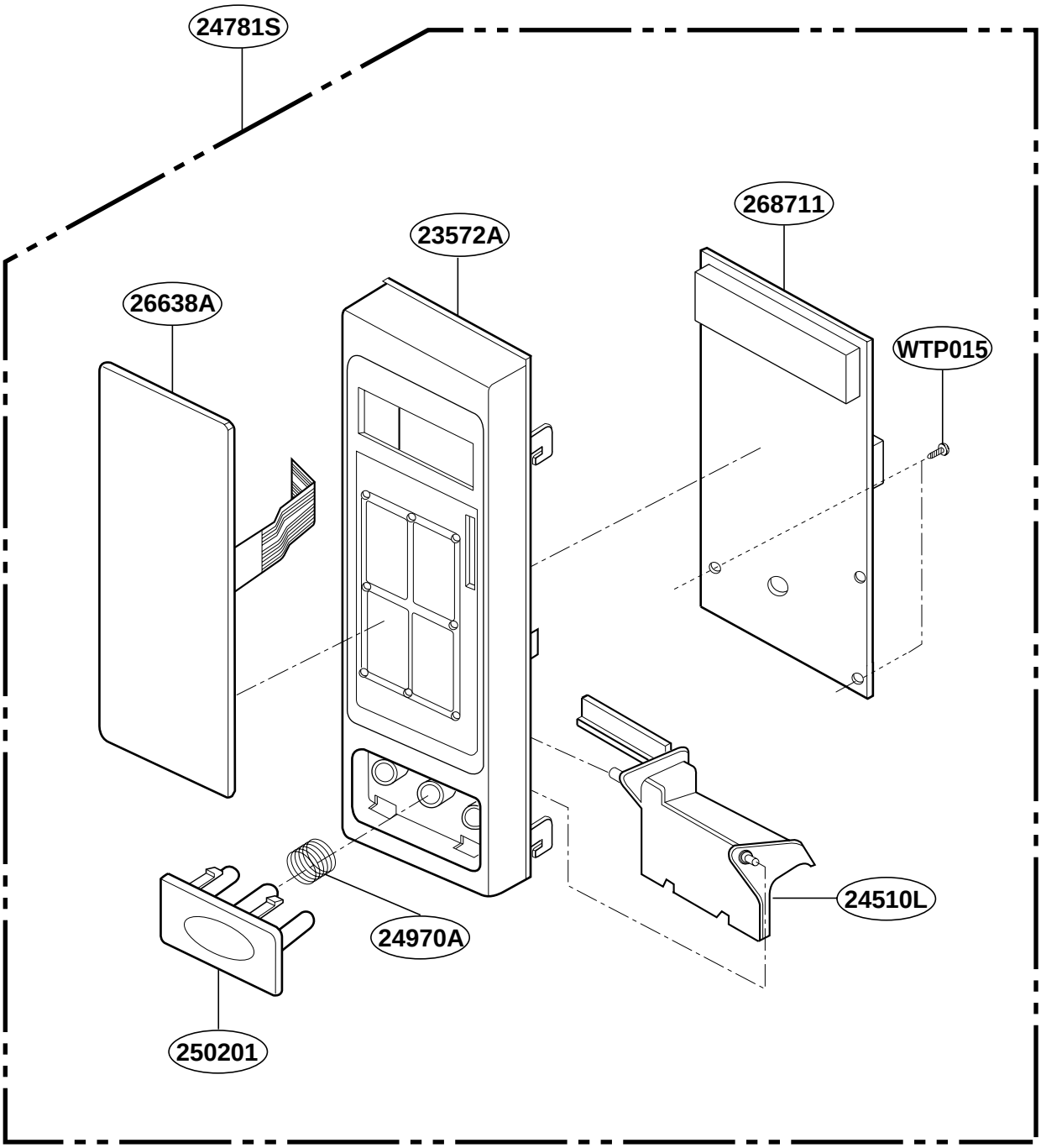
INTRODUCTION



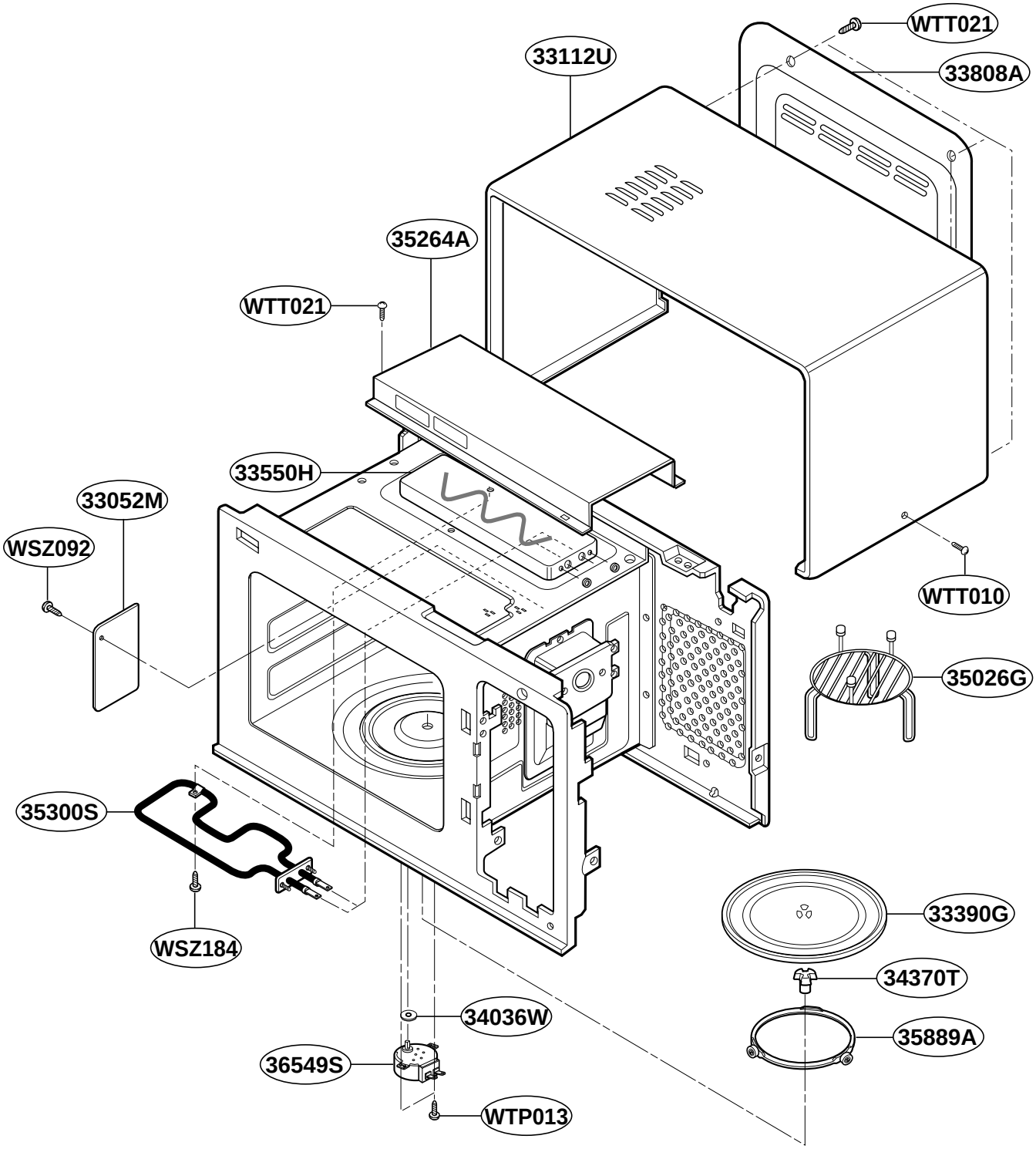
DOOR PARTS



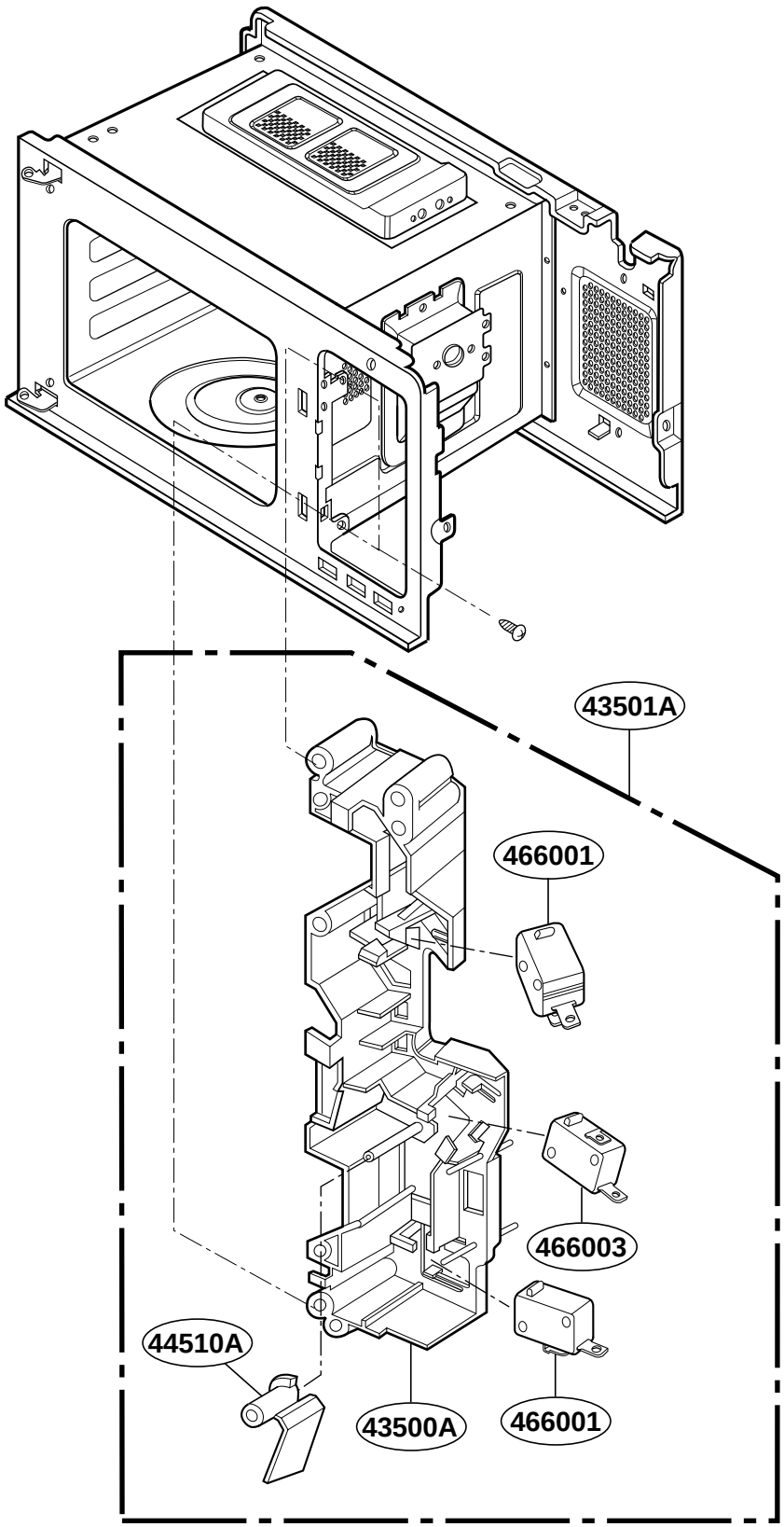
CONTROL PANEL PARTS



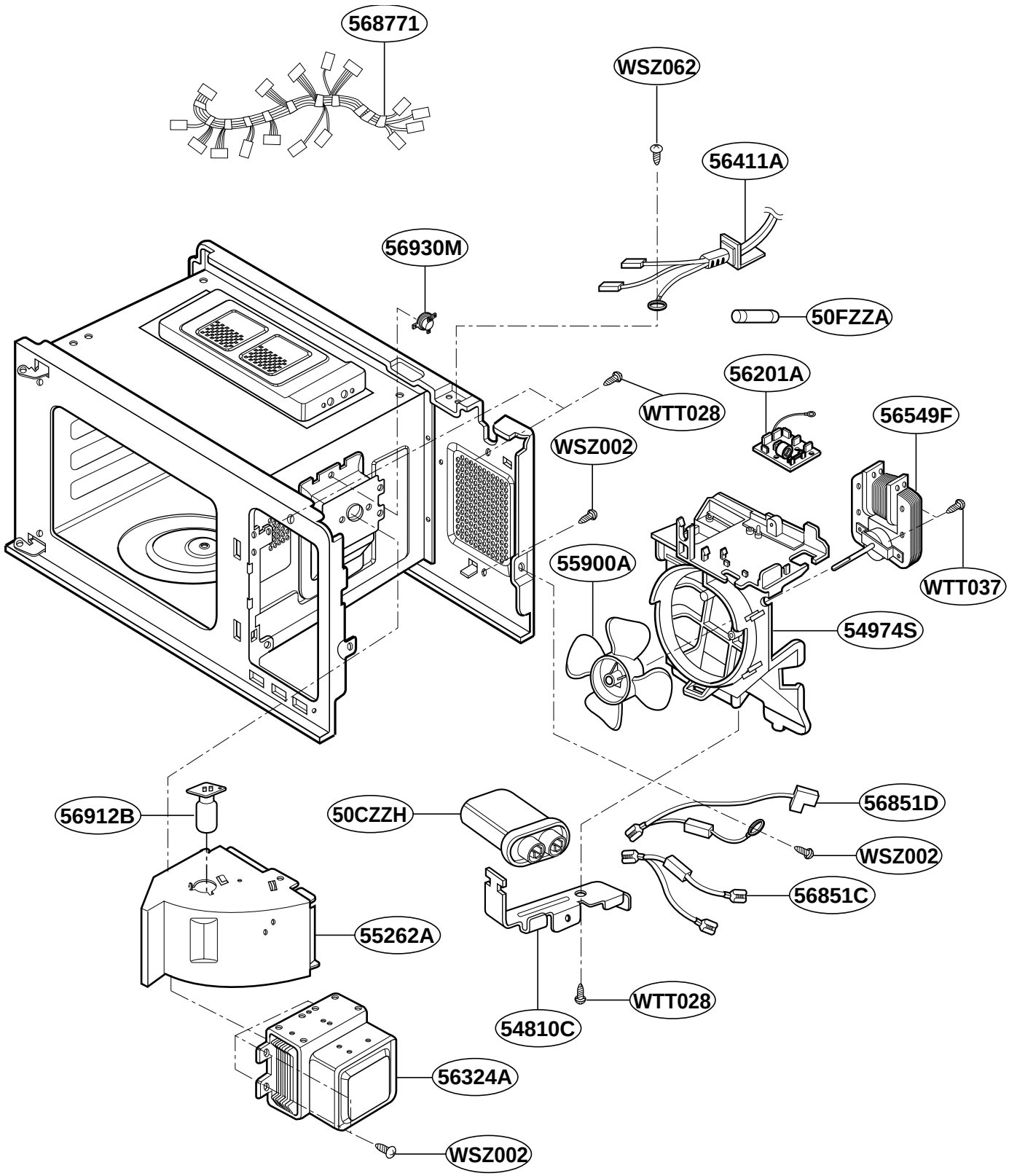
OVEN CAVITY PARTS



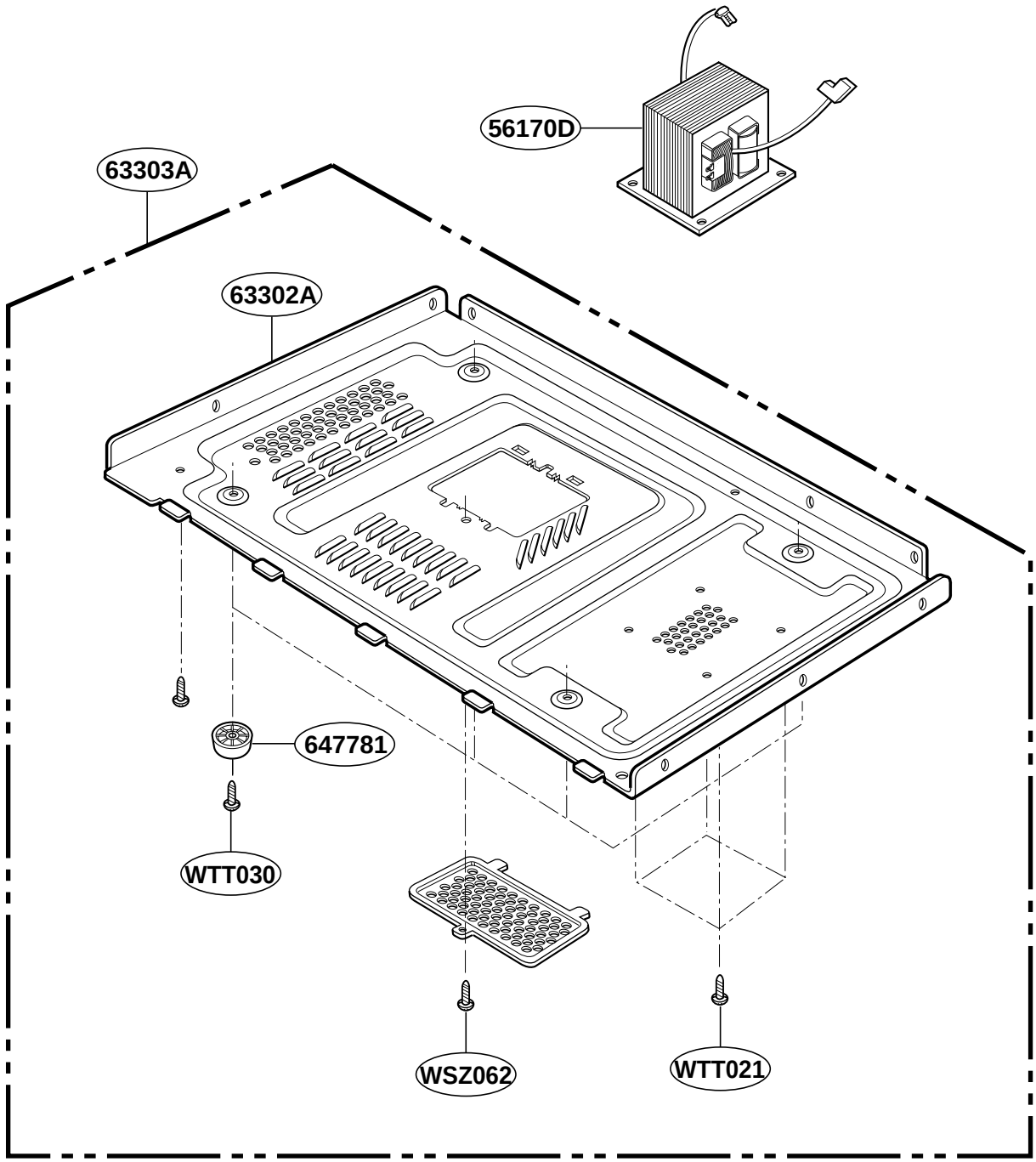
LATCH BOARD PARTS



INTERIOR PARTS



BASE PLATE PARTS



Model No.	Loc No.	P/Part No	C/Part No	Description
MH-654S	*01	MH-654S.MWQ	3828W5A1733	MANUAL,[OWNERS]MWO
MH-654S	*02	MH-654S.MWQ	3828W5S1655	MANUAL,[SERVICE]
MH-654S	*03	MH-654S.MWQ	3878W5B0013	COOK BOOK
MH-654S	13213A	3581W1A202E	3213W1A032L	DOOR FRAME ASSY
MH-654S	13352A	3581W1A202E	4890W1A001H	GLASS
MH-654S	13552A	3581W1A202E	3552W1A042A	CHOKE COVER
MH-654S	13581A	MH-654S.MWQ	3581W1A202E	DOOR ASSY
MH-654S	13720D	3581W1A202E	3720W0D141D	PANEL,[DOOR]
MH-654S	14026A	3581W1A202E	4026W2A012A	LATCH
MH-654S	14970A	3581W1A202E	4970WRA001C	SPRING
MH-654S	15006A	MH-654S.MWQ	5006W3A017A	CAP
MH-654S	23572A	4781W1A159C	3572W0A158A	CONTROL PANEL
MH-654S	24510L	4781W1A159C	4510W3L004A	LEVER,[RELEASE LEVER]
MH-654S	24781S	MH-654S.MWQ	4781W1M207C	CONTROLLER ASSY,[MICOM]
MH-654S	24970A	4781W1A159C	4B72023A	SPRING
MH-654S	250201	4781W1A159C	5020W3A109A	BUTTON
MH-654S	26638A	4781W1M207C	6638W2A275B	KEY MEMBRANE
MH-654S	268711	4781W1M207C	6871W2S077H	PWB(PCB) ASSY,[MAIN]
MH-654S	33052M	MH-654S.MWQ	3052W3M011C	CANOPY,[MICA]
MH-654S	33112U	MH-654S.MWQ	3112W2U006F	OUT CASE,[U-BENDING]
MH-654S	33390G	MH-654S.MWQ	3390W1G010A	TRAY,[GLASS]
MH-654S	33808A	MH-654S.MWQ	3808W1A001A	COVER,MWO[BACK COVER]
MH-654S	34036W	MH-654S.MWQ	4036W3W001A	SEAL,WATER
MH-654S	34370T	MH-654S.MWQ	4370W3A001A	SHAFT,[TURN TABLE SHAFT]
MH-654S	35026G	MH-654S.MWQ	5026W1A037C	SHELF
MH-654S	35300S	MH-654S.MWQ	5300W1S002A	HEATER,SHEATH
MH-654S	35889A	MH-654S.MWQ	5889W2A005J	ROTATING RING ASSY
MH-654S	36549S	MH-654S.MWQ	6549W1S002A	MOTOR(CIRC),SYNCHRONOUS
MH-654S	43500A	3501W1A003H	3500W1A004A	BOARD,[LATCH BOARD]
MH-654S	43501A	MH-654S.MWQ	3501W1A003H	BOARD ASSY,LATCH
MH-654S	466001	3501W1A003H	3B73362F	SWITCH,MICRO
MH-654S	466003	3501W1A003H	3B73361E	SWITCH,MICRO
MH-654S	50CZZH	4975W2S024J	6120W3H003J	CAPACITOR[HIGH VOLTAGE]
MH-654S	50FZZA	4975W2S024J	3B70856K	FUSE[ALL]
MH-654S	54810C	4975W2S024J	4810W4C003A	BRACKET,[CAPACITOR]
MH-654S	54974S	4975W2S024J	4974W1S010A	GUIDE,[SUCTION GUIDE]
MH-654S	55262A	5263W2A025P	5262W2A037B	DUCT
MH-654S	55900A	4975W2S024J	2B72125A	FAN
MH-654S	56170D	MH-654S.MWQ	6170W1D029A	TRANSFORMER,HIGH VOLTAGE
MH-654S	56201A	4975W2S024J	6201W2A021B	FILTER ASSY,NOISE
MH-654S	56324A	MH-654S.MWQ	2B71732B	MAGNETRON
MH-654S	56411A	MH-654S.MWQ	6411W2C002A	POWER CORD ASSY
MH-654S	56549F	4975W2S024J	6549W1F005A	MOTOR(CIRC),FAN
MH-654S	56851D	4975W2S024J	6851W1A001A	CABLE ASSY,CIRCUIT PROTECTOR
MH-654S	568771	MH-654S.MWQ	6877W1A219D	LEAD WIRE ASSY
MH-654S	56912B	5263W2A025P	6912W3B002D	LAMP[OVEN/BASELESS]
MH-654S	56930M	5263W2A025P	6930WRT003B	THERMOSTAT,BIMETAL
MH-654S	63302A	3303W1A013C	3302W1A026D	BASE PLATE
MH-654S	63303A	MH-654S.MWQ	3303W1A013C	BASE PLATE ASSY
MH-654S	647781	3303W1A013C	4B73900A	LEG
MH-654S	948502	5263W2A025P	3B72244T	CUSHION
MH-654S	BZ1	6871W2S077H	6908W3YA01A	BUZZER,PIEZO CERAMIC

MH-654S	C01	6873W2A077H	0CK1040K518	CAPACITOR,CERAMIC (HIGH DIELEC
MH-654S	C02	6873W2A077H	0CE1071K638	CAPACITOR,AL.ELECTROLYTIC
MH-654S	C03	6873W2A077H	0CE2272H638	CAPACITOR,AL.ELECTROLYTIC
MH-654S	C04	6873W2A077H	0CK2230H518	CAPACITOR,CERAMIC (HIGH DIELEC
MH-654S	C05	6873W2A077H	0CK1040K518	CAPACITOR,CERAMIC (HIGH DIELEC
MH-654S	C07	6873W2A077H	0CE2272H638	CAPACITOR,AL.ELECTROLYTIC
MH-654S	C08	6873W2A077H	0CK2230H518	CAPACITOR,CERAMIC (HIGH DIELEC
MH-654S	C09	6873W2A077H	0CK2230H518	CAPACITOR,CERAMIC (HIGH DIELEC
MH-654S	C20	6873W2A077H	0CK2230H518	CAPACITOR,CERAMIC (HIGH DIELEC
MH-654S	C21	6873W2A077H	0CK2230H518	CAPACITOR,CERAMIC (HIGH DIELEC
MH-654S	C25	6873W2A077H	0CK2230H518	CAPACITOR,CERAMIC (HIGH DIELEC
MH-654S	C80	6873W2A077H	0CK2210K518	CAPACITOR,CERAMIC (HIGH DIELEC
MH-654S	C81	6873W2A077H	0CK2210K518	CAPACITOR,CERAMIC (HIGH DIELEC
MH-654S	C82	6873W2A077H	0CK2210K518	CAPACITOR,CERAMIC (HIGH DIELEC
MH-654S	C83	6873W2A077H	0CK2210K518	CAPACITOR,CERAMIC (HIGH DIELEC
MH-654S	CN1	6871W2S077H	6630W5V021A	CONNECTOR (CIRC),WAFER
MH-654S	CN3	6871W2S077H	6630W5YA19C	CONNECTOR (CIRC),WAFER
MH-654S	CR1	6871W2S077H	6212W5M002A	RESONATOR
MH-654S	CU1	6871W2S077H	4850W4C001H	CUSHION
MH-654S	D01	6873W2A077H	0DD400209AA	DIODE,RECTIFIER
MH-654S	D02	6873W2A077H	0DD400209AA	DIODE,RECTIFIER
MH-654S	D03	6873W2A077H	0DD400209AA	DIODE,RECTIFIER
MH-654S	D04	6873W2A077H	0DD400209AA	DIODE,RECTIFIER
MH-654S	D20	6873W2A077H	0DD414809AA	DIODE,SWITCHING
MH-654S	D25	6873W2A077H	0DD414809AA	DIODE,SWITCHING
MH-654S	D26	6873W2A077H	0DD414809AA	DIODE,SWITCHING
MH-654S	D30	6873W2A077H	0DD414809AA	DIODE,SWITCHING
MH-654S	D31	6873W2A077H	0DD414809AA	DIODE,SWITCHING
MH-654S	D32	6873W2A077H	0DD414809AA	DIODE,SWITCHING
MH-654S	DP1	6871W2S077H	0DLZW5A004A	LED
MH-654S	PT1	6871W2S077H	6170W2I006H	TRANSFORMER,POWER
MH-654S	Q01	6873W2A077H	0TR101509AB	TRANSISTOR
MH-654S	Q02	6873W2A077H	0TR101509AB	TRANSISTOR
MH-654S	Q03	6871W2S077H	0IKE790500A	IC,KEC
MH-654S	Q20	6873W2A077H	0TR106009AF	TRANSISTOR
MH-654S	Q30	6873W2A077H	0TR320209BA	TRANSISTOR
MH-654S	Q31	6873W2A077H	0TR181509AB	TRANSISTOR
MH-654S	Q32	6873W2A077H	0TR181509AB	TRANSISTOR
MH-654S	Q50	6873W2A077H	0TR107009AD	TRANSISTOR
MH-654S	Q60	6873W2A077H	0TR181509AB	TRANSISTOR
MH-654S	Q61	6873W2A077H	0TR181509AB	TRANSISTOR
MH-654S	Q62	6873W2A077H	0TR181509AB	TRANSISTOR
MH-654S	Q63	6873W2A077H	0TR181509AB	TRANSISTOR
MH-654S	R01	6873W2A077H	0RD2001F608	RESISTOR,FIXED CARBON FILM
MH-654S	R02	6873W2A077H	0RD1001F608	RESISTOR,FIXED CARBON FILM
MH-654S	R03	6873W2A077H	0RD1002F608	RESISTOR,FIXED CARBON FILM
MH-654S	R04	6873W2A077H	0RD1001F608	RESISTOR,FIXED CARBON FILM
MH-654S	R20	6873W2A077H	0RD1001F608	RESISTOR,FIXED CARBON FILM
MH-654S	R21	6873W2A077H	0RD2202F608	RESISTOR,FIXED CARBON FILM
MH-654S	R22	6873W2A077H	0RD1001F608	RESISTOR,FIXED CARBON FILM
MH-654S	R25	6873W2A077H	0RD4701F608	RESISTOR,FIXED CARBON FILM
MH-654S	R26	6873W2A077H	0RD1001G608	RESISTOR,FIXED CARBON FILM
MH-654S	R30	6873W2A077H	0RD1000G608	RESISTOR,FIXED CARBON FILM
MH-654S	R31	6873W2A077H	0RD1002F608	RESISTOR,FIXED CARBON FILM

MH-654S	R32	6873W2A077H	0RD2001G608	RESISTOR,FIXED CARBON FILM
MH-654S	R33	6873W2A077H	0RD1002F608	RESISTOR,FIXED CARBON FILM
MH-654S	R34	6873W2A077H	0RD3901G608	RESISTOR,FIXED CARBON FILM
MH-654S	R35	6873W2A077H	0RD1002F608	RESISTOR,FIXED CARBON FILM
MH-654S	R36	6873W2A077H	0RD3901F608	RESISTOR,FIXED CARBON FILM
MH-654S	R40	6873W2A077H	0RD1503G608	RESISTOR,FIXED CARBON FILM
MH-654S	R41	6873W2A077H	0RD1503G608	RESISTOR,FIXED CARBON FILM
MH-654S	R42	6873W2A077H	0RD1503G608	RESISTOR,FIXED CARBON FILM
MH-654S	R43	6873W2A077H	0RD1503G608	RESISTOR,FIXED CARBON FILM
MH-654S	R44	6873W2A077H	0RD1202F608	RESISTOR,FIXED CARBON FILM
MH-654S	R45	6873W2A077H	0RD3302F608	RESISTOR,FIXED CARBON FILM
MH-654S	R48	6873W2A077H	0RD4701F608	RESISTOR,FIXED CARBON FILM
MH-654S	R50	6873W2A077H	0RD1000F608	RESISTOR,FIXED CARBON FILM
MH-654S	R51	6873W2A077H	0RD1001G608	RESISTOR,FIXED CARBON FILM
MH-654S	R56	6873W2A077H	0RD1004F608	RESISTOR,FIXED CARBON FILM
MH-654S	R60	6873W2A077H	0RD1001F608	RESISTOR,FIXED CARBON FILM
MH-654S	R61	6873W2A077H	0RD1001F608	RESISTOR,FIXED CARBON FILM
MH-654S	R62	6873W2A077H	0RD1001F608	RESISTOR,FIXED CARBON FILM
MH-654S	R63	6873W2A077H	0RD1001F608	RESISTOR,FIXED CARBON FILM
MH-654S	R64	6873W2A077H	0RD4702F608	RESISTOR,FIXED CARBON FILM
MH-654S	R65	6873W2A077H	0RD4702F608	RESISTOR,FIXED CARBON FILM
MH-654S	R66	6873W2A077H	0RD4702F608	RESISTOR,FIXED CARBON FILM
MH-654S	R67	6873W2A077H	0RD4702F608	RESISTOR,FIXED CARBON FILM
MH-654S	R80	6873W2A077H	0RD2202F608	RESISTOR,FIXED CARBON FILM
MH-654S	R81	6873W2A077H	0RD2202F608	RESISTOR,FIXED CARBON FILM
MH-654S	R82	6873W2A077H	0RD2202F608	RESISTOR,FIXED CARBON FILM
MH-654S	R83	6873W2A077H	0RD2202F608	RESISTOR,FIXED CARBON FILM
MH-654S	R84	6873W2A077H	0RD1002F608	RESISTOR,FIXED CARBON FILM
MH-654S	R85	6873W2A077H	0RD1002F608	RESISTOR,FIXED CARBON FILM
MH-654S	R86	6873W2A077H	0RD1002F608	RESISTOR,FIXED CARBON FILM
MH-654S	R87	6873W2A077H	0RD1002F608	RESISTOR,FIXED CARBON FILM
MH-654S	R88	6873W2A077H	0RD1002F608	RESISTOR,FIXED CARBON FILM
MH-654S	R90	6873W2A077H	0RD0472F608	RESISTOR,FIXED CARBON FILM
MH-654S	R91	6873W2A077H	0RD0472F608	RESISTOR,FIXED CARBON FILM
MH-654S	R92	6873W2A077H	0RD0472F608	RESISTOR,FIXED CARBON FILM
MH-654S	R93	6873W2A077H	0RD0472F608	RESISTOR,FIXED CARBON FILM
MH-654S	R94	6873W2A077H	0RD0472G608	RESISTOR,FIXED CARBON FILM
MH-654S	R95	6873W2A077H	0RD0472G608	RESISTOR,FIXED CARBON FILM
MH-654S	R96	6873W2A077H	0RD0472G608	RESISTOR,FIXED CARBON FILM
MH-654S	R97	6873W2A077H	0RD0472F608	RESISTOR,FIXED CARBON FILM
MH-654S	R98	6873W2A077H	0RD0472F608	RESISTOR,FIXED CARBON FILM
MH-654S	R99	6873W2A077H	0RD0472F608	RESISTOR,FIXED CARBON FILM
MH-654S	RY1	6871W2S077H	6920W5A008A	RELAY
MH-654S	RY2	6871W2S077H	6920W2YD04A	RELAY
MH-654S	RY3	6871W2S077H	6920W2YD05A	RELAY
MH-654S	U01	6871W2S077H	0IZZW5A021B	IC
MH-654S	WNZ015	MH-654S.MWQ	4B71028B	NUT
MH-654S	WSZ002	MH-654S.MWQ	1SBF0402418	SCREW TAP TITE(S),BINDING HEAD
MH-654S	WSZ085	MH-654S.MWQ	4B70188C	SCREW,
MH-654S	WSZ094	MH-654S.MWQ	4B70572D	SCREW,
MH-654S	WSZ184	MH-654S.MWQ	1SZZW2Z001E	SCREW,
MH-654S	WTP004	5263W2A025P	1TPL0302418	SCREW TAPPING,PAN HEAD
MH-654S	WTP013	MH-654S.MWQ	1TPL0402418	SCREW TAPPING,PAN HEAD
MH-654S	WTP015	4781W1M207C	1TPL0402618	SCREW TAPPING,PAN HEAD

MH-654S	WTT010	MH-654S.MWQ	1TTG0402422	SCREW TAPPING,TRUSS HEAD
MH-654S	WTT021	MH-654S.MWQ	1TTL0402418	SCREW TAPPING,TRUSS HEAD
MH-654S	WTT028	3303W1A013C	1TTL0402818	SCREW TAPPING,TRUSS HEAD
MH-654S	WTT028	4975W2S024J	1TTL0402818	SCREW TAPPING,TRUSS HEAD
MH-654S	WTT028	MH-654S.MWQ	1TTL0402818	SCREW TAPPING,TRUSS HEAD
MH-654S	WTT037	4975W2S024J	1TTL0403818	SCREW TAPPING,TRUSS HEAD
MH-654S	ZD1	6873W2A077H	0DZ510009AE	DIODE,ZENER

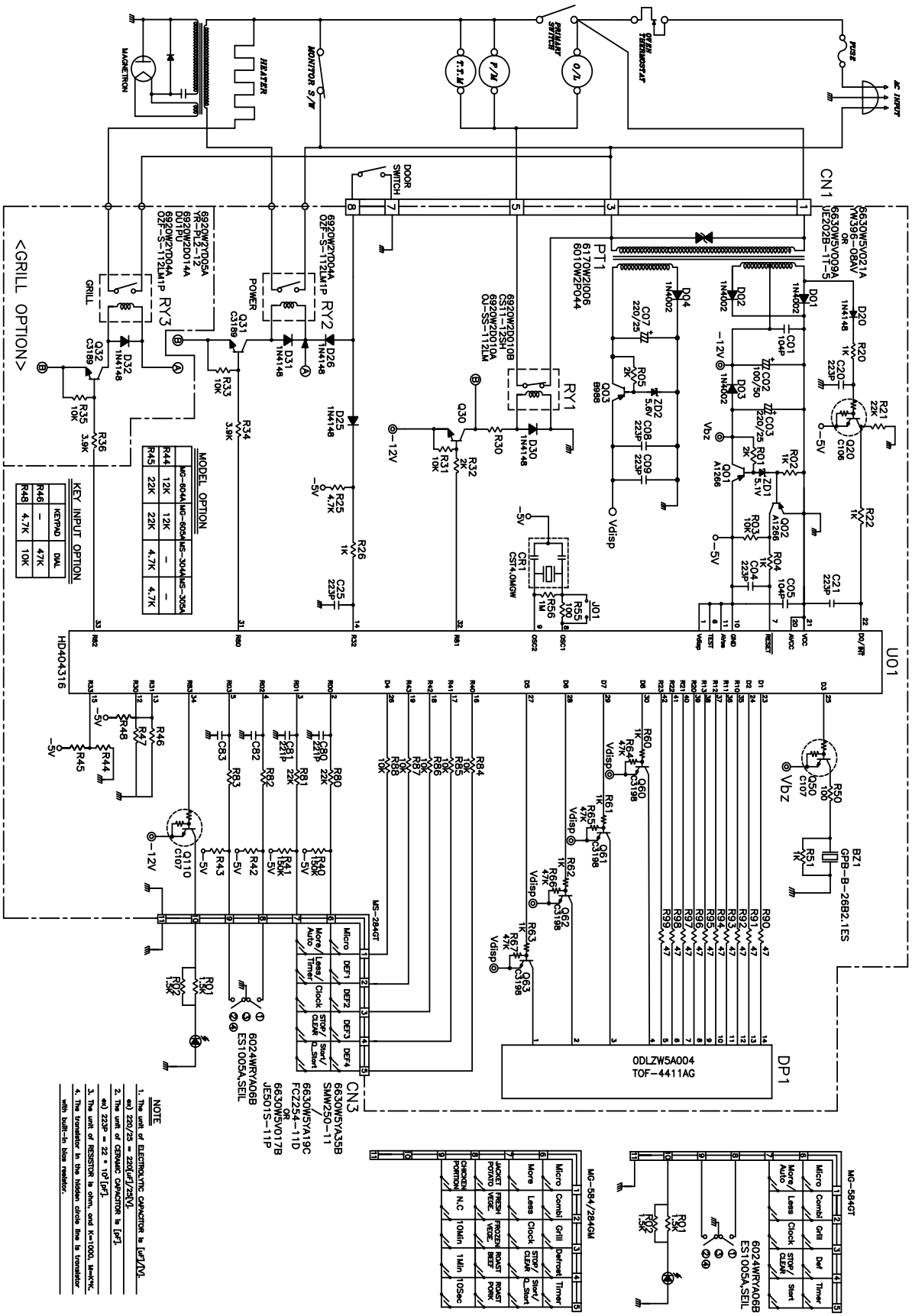
Spec	Level	Code
MH-654S RUSSIA-BWT RUSSIAN	1	R
MH-654S RUSSIA-BWT ENGLISH A4 MG-554S 3828W5S1614	1	R
MC-783RC CIS RUSSIAN	1	R
MG-533MD,BK(ED), WITHOUT ,SCP	2	R
374.0* 251.0MM T2.0 MH-654S CLEAR	2	R
MS-252S,PP	2	R
MH-654S RUSSIA-BWT BLUE WHITE LG	1	R
ABS XR-401 03587 BLUE WHITE MH-654S RUSS	2	R
MS-152MC,POM,150MM	2	R
MS-71MC	2	R
MH-684GS,PP,NEW TYPE	1	R
ABS XR-401 03587 BLUE WHITE MS	3	R
MS-19S	3	R
MH-654S RUSSIA-BWT BLUE WHITE LG	1	R
TEST	3	R
RELEASE XR-401 03587 LGENE	3	R
MH-654S RUSSIA-BWT BLUE WHITE LG RUSSIAN	2	R
P2-8077 MG-554R 25L BSH	2	R
MICA T0.4 111.5MM 140.3MM LGEC	1	R
PAINT BLUE WHITE 0.9CU.FT LGECW MH-655T	1	R
DIA. 284MM 770G 5T HKG LGECW	1	R
MG-553S,SBHG1-R, O.5T	1	R
SILICON RUBBER	1	R
MH-8845D	1	R
MB-483MCD,COATING+FOOT ,L:120*	1	R
230V 50HZ 1200W KAWAI	1	R
D 222 H14 PPS(R-7) BROWN(NA)	1	R
21V 50/60HZ SHINIL FREE 5/6RPM	1	R
MS-101'S,121'S,151'S	2	R
0.9,1.0,1.2,1.5CU.FT	1	R
SZM-V16-FA-63 LG UL/CSA 125V 1	2	R
SZM-V16-FA-62 LG UL/CSA 125/25	2	R
2100VAC 1.05UF VDE 85 TAEYANG	2	R
10A 250V CERAMIC TS UL SAMJOO	2	R
MA-690M	2	R
MA-690M	2	R
0.9 CU.FT SECC /SBHG 0.5T,LGETA ONLY	2	R
DIA.110 CCW 4 WING	2	R
230V 50HZ 900W 2190V 3.26V N CU/CU KTC LGECW	1	R
250V 76* 65MM D 6.3	2	R
850W 2M214-39F LG 350MA 2.85-3	1	R
HO5VV-F,3G 1.5MM	1	R
220-240V 50/60HZ 10.5MM 2800RPM 47.0MM - LEFT OH S	2	R
H.V.D+CIRCUIT PROTECTOR HVR-1X-06B 2X062HOA 85 MM	2	R
LGECW MH-656EL RUSSIA	1	R
24025W-25 DUKWOO/KYUNGJUN 240V 25W CLEAR	2	R
145 /60 PW-2N VERTICAL 125V,15	2	R
DOMESTIC,0.9CU.FT	2	R
MR-272M	1	R
D 24.0 D 20.0 H 14.0 LDPE BLAC	2	R
5T 8W 300L SPONGE	2	R
GPB-B-26B2.1ES(EXTERNAL)	3	R

0.1000UF 50V K B TA26	4 R
100UF SM 50V M FM5 TP5	4 R
220UF SME 25V M FM5 TP5	4 R
0.0220UF 25V K B TA26	4 R
0.1000UF 50V K B TA26	4 R
220UF SME 25V M FM5 TP5	4 R
0.0220UF 25V K B TA26	4 R
0.0220UF 25V K B TA26	4 R
0.0220UF 25V K B TA26	4 R
0.0220UF 25V K B TA26	4 R
0.0220UF 25V K B TA26	4 R
220PF 50V K B TA26	4 R
220PF 50V K B TA26	4 R
220PF 50V K B TA26	4 R
220PF 50V K B TA26	4 R
YW396-08AV(2,4,6V) - - STRAIGHT SN	3 R
FCZ254-11D	3 R
CSTS0400MG06-T2 MURATA 4.0MHZH	3 R
9.0T 10W 35L SPONGE	3 R
1N4002 TP PYUNG CHANG	4 R
1N4002 TP PYUNG CHANG	4 R
1N4002 TP PYUNG CHANG	4 R
1N4002 TP PYUNG CHANG	4 R
1N4148 26MM	4 R
1N4148 26MM	4 R
1N4148 26MM	4 R
1N4148 26MM	4 R
1N4148 26MM	4 R
1N4148 26MM	4 R
TOF-4411AG BK OASIS GREEN 6000	3 R
230V/50HZ,12V/280MA,8.5V/180MA	3 R
A1015=KTA12660 KEC O TO-92 TP	4 R
A1015=KTA12660 KEC O TO-92 TP	4 R
KIA79L05P 3 TO-92 LIN REG	3 R
KRC 106M KEC	4 R
KTC3202-O TP KEC TO92 MWO	4 R
KTC1815-Y=KTC3198YTO-92 TP KEC	4 R
KTC1815-Y=KTC3198YTO-92 TP KEC	4 R
KRC 107M TP KEC	4 R
KTC1815-Y=KTC3198YTO-92 TP KEC	4 R
KTC1815-Y=KTC3198YTO-92 TP KEC	4 R
KTC1815-Y=KTC3198YTO-92 TP KEC	4 R
KTC1815-Y=KTC3198YTO-92 TP KEC	4 R
2K 1/6W 5% TA26	4 R
1.0K 1/6W 5 TA26	4 R
10K 1/6W 5 TA26	4 R
1.0K 1/6W 5 TA26	4 R
1.0K 1/6W 5 TA26	4 R
22K 1/6W 5 TA26	4 R
1.0K 1/6W 5 TA26	4 R
4.7K 1/6W 5 TA26	4 R
1K OHM 1/4 W 5% TA26	4 R
100 OHM 1/4 W 5% TA26	4 R
10K 1/6W 5 TA26	4 R

2.0K 1/4W 5 TA26	4 R
10K 1/6W 5 TA26	4 R
3.9K 1/4W 5 TA26	4 R
10K 1/6W 5 TA26	4 R
3.9K 1/6W 5 TA26	4 R
150K 1/4W 5 TA26	4 R
150K 1/4W 5 TA26	4 R
150K 1/4W 5 TA26	4 R
150K 1/4W 5 TA26	4 R
12K 1/6W 5 TA26	4 R
33K 1/6W 5 TA26	4 R
4.7K 1/6W 5 TA26	4 R
100 1/6W 5 TA26	4 R
1K OHM 1/4 W 5% TA26	4 R
1.0M 1/6W 5 TA26	4 R
1.0K 1/6W 5 TA26	4 R
1.0K 1/6W 5 TA26	4 R
1.0K 1/6W 5 TA26	4 R
1.0K 1/6W 5 TA26	4 R
47K 1/6W 5 TA26	4 R
47K 1/6W 5 TA26	4 R
47K 1/6W 5 TA26	4 R
47K 1/6W 5 TA26	4 R
22K 1/6W 5 TA26	4 R
22K 1/6W 5 TA26	4 R
22K 1/6W 5 TA26	4 R
22K 1/6W 5 TA26	4 R
10K 1/6W 5 TA26	4 R
10K 1/6W 5 TA26	4 R
10K 1/6W 5 TA26	4 R
10K 1/6W 5 TA26	4 R
10K 1/6W 5 TA26	4 R
47 1/6W 5% TA26	4 R
47 1/6W 5% TA26	4 R
47 1/6W 5% TA26	4 R
47 1/6W 5% TA26	4 R
47 OHM 1/4 W 5% TA26	4 R
47 OHM 1/4 W 5% TA26	4 R
47 OHM 1/4 W 5% TA26	4 R
47 1/6W 5% TA26	4 R
47 1/6W 5% TA26	4 R
47 1/6W 5% TA26	4 R
DQ1U DAIICHI DC12V DC16.7MA DC	3 R
OZF-S-112LM1P,DC12V,SPST,OEG	3 R
YR-PL2-12/CS-1PD,DC12V YOUNG R	3 R
HD404316S HITACHI 42P,DIP BK D	3 R
M4	1 R
#NAZWA?	1 R
#NAZWA?	1 R
D4.0 L12.0	1 R
+ D4.0 L8.0 MSWR3 / FN 1 PITCH NO NO TRUSS	1 R
D 3.0 L 8.0 MSWR3/FZY	2 R
D 4.0 L 8.0 MSWR3/FZY	1 R
+ 2 CUT D4.0 L10.0 MSWR3 / FZY	2 R

+ 1 D4.0 L8.0 MSWR3/FN	1 R
D 4.0 L 8.0 MSWR3/FZY	1 R
D 4.0 L 12 MSWR3/FZY	2 R
D 4.0 L 12 MSWR3/FZY	2 R
D 4.0 L 12 MSWR3/FZY	1 R
D 4.0 L 28 MSWR3/FZY	2 R
UZ5.1BS TP26 SM 0.5W	4 R

SCHEMATIC DIAGRAM OF P.C.B



PRINTED CIRCUIT BOARD